United States Court of Appeals
for the
District of Columbia Circuit

TRANSCRIPT OF RECORD

JOINT APPENDIX

822

IN THE

United States Court of Appeals

FOR THE DISTRICT OF COLUMBIA CIRCUIT

No. 13,985

APPLETON ELECTRIC COMPANY, *Appellant*,

v.

ROBERT C. WATSON, Commissioner of Patents, *Appellee*.

Appeal from the United States District Court for the District of Columbia

United States Court of Appeals
For the
District of Columbia Circuit

FILED AUG 14 1957

Joseph W. Stewart
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IN THE

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FOR THE DISTRICT OF COLUMBIA CIRCUIT

No. 13,985

APPLETON ELECTRIC COMPANY, *Appellant,*

v.

ROBERT C. WATSON, Commissioner of Patents, *Appellee.*

Appeal from the United States District Court for the District of Columbia

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JOINT APPENDIX

Filed July 27 1954

158 IN THE

UNITED STATES DISTRICT COURT

FOR THE DISTRICT OF COLUMBIA

APPLETON ELECTRIC COMPANY, a corporation, and NILS A. TORNBLOM, an individual, 1713 Wellington Ave., Chicago, Ill., *Plaintiffs,*

vs.

ROBERT C. WATSON, Commissioner of Patents, *Defendant.*

Civil Action No. 3200-54

Complaint

1. This action arises under section 145 of Title 35 of the United States Code (formerly R.S. 4915; 35 U.S.C., 1946 ed., 63).

2. No appeal has been taken herein to the Court of Customs and Patent Appeals.

3. Plaintiff, APPLETON ELECTRIC COMPANY, is a corporation created and existing under the laws of the State of Illinois, with its principal office and place of business at 1713 Wellington Avenue, Chicago, Illinois.

4. Plaintiff, NILS A. TORNBLOM, is an individual who for the past several years has been employed by Appleton Electric Company as its Chief Engineer, and, more recently, as an engineering consultant to said corporation.

5. On December 3, 1947, said Nils A. Tornblom filed an application for patent in the United States Patent Office, entitled Explosionproof Light Fixture of the Vented Type and given Serial No. 789,444. Said application was
159 assigned to the plaintiff corporation and said assign-

ment was duly recorded in the United States Patent Office on December 19, 1947, Liber H214, Page 11.

6. Claims Nos. 14, 15, 16, 18 through 23, and 25, of said application were finally rejected by the Primary Examiner and on appeal taken from his decision, the Board of Appeals affirmed said decision. The defendent has refused and still refuses to grant a patent on said application as to claims Nos. 14, 15, 16, 18 through 23, and 25.

7. The claims in issue are as follows:

> 14. In an explosionproof fluorescent lighting fixture, the combination comprising a first end casing having internal partition walls defining terminal and lamp and ballast chambers with connecting passages therebetween, gas seal plugs disposed in certain ones of said passages, said plugs being adapted to isolate mechanically but not electrically said terminal chamber from said lamp and ballast chambers, a second end casing having lamp and switch chambers in direct communication with each other, means including at least one protective glass tube connecting the lamp and switch chambers of said second casing with the lamp and ballast chambers of said first casing, a hollow strut interposed between said end casings, and another gas seal plug housed within said first end casing but precluding mechanical and not electrical communication between said terminal chamber and said second casing via said strut.
>
> 15. In an explosionproof lighting fixture, the combination of a first unitary end casting having laterally spaced apertures therein, internal bosses defining sockets around said apertures, said internal bosses also defining in said casting a central terminal chamber and a pair of lamp chambers flanking the same and connected thereto by wireways, a second unitary end casting having laterally spaced apertures therein with internal bosses defining sockets around said apertures, a pair of

protective lamp enclosing tubes connecting corresponding sockets of said castings and fixed to the same by means of gas tight joints, a pair of external central bosses on said end castings and having wireways therein, a hollow supporting strut interposed between said external bosses and connected in gas tight relation therewith, gas seal plugs in said wireways, and electrical wiring in said wireways communicating between electrical components of said end castings via said seal plugs.

16. In an electric lighting fixture, an explosionproof fixture casing enclosed partially by a solid impervious wall having a detachable portion and partially by a rigid pervious wall of porous metal integral with said detachable portion of said impervious wall.

18. In an electric lighting fixture, the combination of an explosionproof fixture casing having a solid impervious wall with an access aperture therein, and a handhole plug having a seating surface of solid wall material integrally bonded to a rigid sintered metallic panel of substantial thickness.

19. An electric lighting fixture characterized by an explosionproof casing having a threadedly detachable solid wall portion integrally bonded to a rigid sintered metallic wall panel.

20. In an explosionproof lighting fixture having an internally partitioned casing including a pair of chambers sealed each from the other against the passage of gas therebetween, said chambers having electrical components therein and access openings to the exterior of said fixture, the combination comprising closure members for said access openings, and rigid porous metallic panels unitary with said closure members, said panels being adapted to dissipate gas pressure resulting from internal explosions within said chambers while arresting the passage of flame therefrom.

21. In an explosionproof lighting fixture having a terminal chamber and a lamp chamber sealed each from the other, the combination of a casing having a solid walled portion defining at least a part of each said chamber, a detachable casing element defining another part of each said chamber, and a rigid heat resistant porous metallic panel integral with each said detachable casing element for flameless venting of internal gas pressure from either of said chambers to the exterior of said fixture.

161 22. An explosionproof fluorescent lighting fixture comprising, in combination, a pair of spaced apart end casings connected by means of a hollow strut and a glass protective tube, internal partitions in one of said end casings defining a terminal chamber as well as a lamp chamber and a ballast chamber, said partitions also defining sealing wells between said terminal chamber and said other chambers, a plurality of gas seal plugs disposed in respective ones of said sealing wells to isolate said terminal chamber from the potentially arcing portions of said fixture in said other chambers, and casing wall elements detachably secured to said one casing, said elements including rigid porous metallic plates for explosionproof venting of any one of said chambers to the exterior of said fixture.

23. In an explosionproof fluorescent lighting fixture, the combination of a first end casing having internal partition walls defining terminal and lamp and ballast chambers with connecting passages therebetween, gas seal barriers disposed between said terminal chamber and said lamp chamber but not between said lamp chamber and said ballast chamber, said first end casing having access apertures opening from said terminal chamber and said lamp chamber to the exterior of said fixture, a second end casing having lamp and switch chambers in direct communication with each other, said second casing having access apertures opening from said lamp chamber to the exterior of said fixture, pro-

tective glass tubes connecting the lamp chambers of said first and second end casings, detachable plugs for closing the access apertures of the respective chambers, each said plug having a rigid porous metallic wall integral therewith for explosionproof venting of internal gas pressure from any one of said chambers to the exterior of said fixture.

25. In an explosionproof film illuminating fixture for use in recessed wall mountings in hospital operating rooms and the like, the fixture having spaced apart end casings with access openings to permit servicing thereof, the combination comprising closure members for the access openings of said end casings, a cabinet enclosing said fixture and defining a reflector therefor, a detachable front panel on said cabinet, a gas tight swivel fitting fixed to the bottom of said cabinet for supporting the fixture in an upright position therein, said swivel fitting being adapted to house the power supply leads for said fixture, and a clip for releasably retaining said fixture in upright position within said cabinet while leaving the fixture free to be tilted out for servicing upon removal of said front panel.

162 WHEREFORE, the plaintiffs demand judgment directing the Commissioner of Patents to issue a patent to the plaintiff corporation including said claims.

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Of Counsel

Filed Aug 20, 1954

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Answer to the Complaint

To the Honorable Judges of the United States District
Court for the District of Columbia

1, 2, 3. The defendant admits the allegations of paragraphs 1, 2, and 3 of the complaint.

4. He is not informed as to the allegations of paragraph 4.

5, 6, 7. He admits the allegations of paragraphs 5, 6, and 7.

Further answering, the defendant states that the plaintiffs are not entitled to a patent containing any of the claims
set forth in the complaint for the reasons given and
164 in view of the references cited in the Examiner's
statement and the decision of the Board of Appeals in
the application here involved. Profert of copies of the said statement, decision, and references is hereby made.

Respectfully submitted,

E. L. Reynolds
Solicitor, U. S. Patent Office
Attorney for Defendant.

Specification

To all whom it may concern:

Be it known that I, Nils A. Tornblom, a citizen of the United States residing at Chicago, in the County of Cook, and State of Illinois, have invented a certain new and useful Explosionproof Light Fixture of the Vented Type, of which the following is a specification.

The present invention pertains generally to electric lighting fixtures and more specifically to an explosionproof lighting fixture adapted to house one or more tubular lamps of the type which produce light by means of an electrical discharge through a gas or vapor therein. The invention finds particular, but no means exclusive, utility as a film viewing device for use in locations where the atmosphere may be contaminated with explosive gases, vapors, or dust.

As an incident to the use of lamps of the foregoing character, certain ancillary electrical components such as ballast and starter units are required. These are customarily mounted within the fixture and in close proximity to the lamps. While the possibility is somewhat remote that such units or any other portion of the fixture will break down electrically and produce an arc or excessive heat, this possibility must nevertheless be taken into consideration in the design of fixtures for chemical plants, laboratories, hospital operating rooms and the like where the atmosphere is apt to contain inflammable or explosive gases, vapors or dust. Accordingly, certain explosionproof lighting fixtures suchu as the one disclosed in my prior patent No. 2,392,202, issued on January 1, 1946, have been developed for accommodating fluorescent or similar lamps. In such a fixture, the potentially arcing portions thereof are completely housed and segregated from the surrounding atmosphere so that if an arc within the fixture should ignite inflammable or explosive gases which might have filtered in from the outside, such gases in the surrounding atmosphere will not become ignited.

One of the objects of the invention is to provide a fixture of the type indicated wherein provision is made for dissipating internal gas pressure without permitting the leakage of any flame, such internal gas pressure resulting, for example, from ignition of an explosive mixture including gases filtering into the fixture from the surrounding outside atmosphere.

Another object is to provide an explosionproof fixture of the character set forth wherein all the electrical components thereof are readily accessible for servicing, or can be made accessible within a remarkably short time, the fixture being admirably well suited for use as an X-ray film viewer in a hospital operating room and adapted for recessed mounting in the wall thereof.

A further object is to provide a fixture of the above type having an improved and simplified sealing arrangement between the internal compartments thereof.

Still another object is to provide a fixture of simple, rugged construction, being formed from a minimum number of parts and susceptible of economical manufacture.

Other objects and advantages of the invention will become apparent as the following detailed description proceeds, taken in connection with the accompanying drawings, in which:

Figure 1 is a perspective view of a cabinet which houses the illustrative fixture embodying the invention.

Fig. 2 is a front elevation of the fixture and cabinet with portions of both broken away to bring out details of construction.

Fig. 3 is a vertical sectional view through the fixture and cabinet of Fig. 2, taken in the plane of the line 3-3.

Fig. 4 is a fragmentary detailed sectional view through the lower end casing of the fixture of Fig. 3, taken in the plane of the line 4-4.

Fig. 5 is a slightly enlarged plan view of the lower end casing of the fixture with portions broken away to show the seals between compartments.

Figs. 6 and 7 are vertical sectional views through the lower end casing of Fig. 5, taken respectively in the planes of the lines 6-6 and 7-7.

Fig. 8 is a diagrammatic view of the electrical wiring of the illustrative fixture, the relationship between the wiring and the sealing arrangement being clearly indicated.

While the present invention is susceptible of various modifications and alternative constructions, an illustrative embodiment has been shown in the drawings and will be described in some detail but it should be understood that there is no intention to limit the invention to the specific form disclosed, the intention being, on the contrary, to cover all forms falling within the spirit and scope of the invention as expressed in the appended claims.

Referring more specifically to the drawings, it will be perceived that an exemplary fixture 10 embodying the invention is housed within a generally upright cabinet 11 and in the present instance is designed to accommodate a pair of fluorescent lamps 12. The fixture 10 comprises an upper end casing 14 and a lower end casing 15 maintained in spaced apart parrallel relationship by means of a hollow strut 16. Spanning the distance between the end casing 14, 15 and rigidly fixed therein so as to respectively surround each of the lamps 12 are a pair of heavy tubes 18 of fire resisting glass such as Pyrex.

The cabinet 11 is a trough-like enclosure having rear and side walls 19, 20 bent to form an appropriate reflector for the fixture 10 and preferably finished with a light colored reflecting surface. The side walls terminate at their ends in top and bottom panels 21, 22 rigidly attached thereto to form a box which can easily be recessed into a wall 24 as indicated in Fig. 3. The cabinet is also provided with a front panel 25 having a marginal portion 26 adapted to overlie the wall when the fixture is installed. The panel 25 is formed with a relatively large aperture 28 surrounded by an offset marginal portion of the former and closed by means of a translucent or transparent window panel 29 which may be held in place as by the use of resilient clips 30. Not only does the window panel 29 render the fixture 10 susceptible of use as a source of general illumination of even intensity, but in addition, adapts it to various specialized applications such as an X-ray film illuminator.

Turning now to the upper end casing 14 as shown in Figs. 2 and 3, it will be seen that this member is a unitary, oblong structure which is preferably fabricated as a metal casting. Adjacent either extremity, the casing 14 is formed with a large bore 31 for receiving each lamp 12 and its surrounding protective tube 18 which abuts against an annular shoulder 32. The latter also serves as an anchoring means for a series of lamp cushioning springs 34. In the vicinity of its ends, each of the tubes 18 has a side wall which thickens progressively along its length. Thus when a lead sealing ring 35 or the like is forced or poured into the bore 31 around the periphery of the end portion of the tube 18, the latter is effectively locked in place and tightly sealed against the leakage of any gas thereby. In order to permit installation of the lamps 12 together with their sockets 36, starter units S and the necessary wiring, and also to render the same accessible for servicing, the casing 14 is equipped with a pair of handhole plugs 38 threadedly mounted in bores 39 substantially coaxial with the lamp bores 31. The plugs 38 may optionally be fashioned with a plurality of upstanding lugs 40 to facilitate easy turning of the former.

As a result of the foregoing construction, the internal bosses formed in the casing 14 to define the bores 31 and 39 partially divide the enclosed volume of the former into a pair of lamp compartments 41 separated by a central compartment 42 which communicates with each of the others. Mounted in the central compartment 42 is a rotary snap switch 44 for energizing the lamps 12 of the fixture. The stem of the switch 44 is preferably extended as at 45 so as to project through the front panel 25 of the cabinet, being provided at its free end with a suitable actuating handle 46. Centrally but rearwardly located on the casing 14 is a hollow, depending boss 48 which threadedly receives the upper end of the hollow strut 16, permitting electrical wiring to be run from the latter to the switch 44 and to the upper ends of the lamps. The upper end of the strut 16 is threaded rather deeply into the boss 48 in order to obtain a gas tight joint.

Upon closer inspection of Figs. 2 to 7 inclusive, it will be noted that the lower end casing 15 comprises a rigid structure which houses the lower ends of the lamps 12 and their protective tubes 18 together with the ballast unit B, the terminal block 49, and various electrical connections. The casing 15, like its counterpart at the other end of the fixture, is preferably fabricated as a metallic casting having relatively heavy walls. Internally, the casing 15 is compartmented by integral partition walls so as to define a first or terminal chamber 50, a pair of second or lamp chambers 51, and a third or ballast chamber 52. Closure means for the latter is provided in the form of an elongate plate 54 rigidly fixed to the casing 15 and sealed thereagainst as by means of a ground metal-to-metal joint. Centrally and rearwardly located on the casing 15 is a hollow upstanding boss 55 having a partially threaded axial bore which communicates with the terminal chamber 50. Like its counterpart, the boss 55 is arranged to threadingly receive the lower end of the hollow strut 16 in a manner which produces an effective gas tight joint. In order to provide access to the interior of the chamber 50, the top wall of the latter is thickened and formed with a threaded bore 56, the latter receiving a handhole plug 58 which is substantially identical with the plugs 38 used in the upper end casing 14. Centrally located in the bottom wall of the chamber 50, are a pair of alined hollow bosses 59, 60, the former being internal and the latter being external. These bosses serve to define a circular axial passage 61 through which suitable electrical supply leads L1, L2 can be led from the exterior of the fixture 10 to the terminal block 49 thereof. As indicated in Figs. 3, 4, and 7, the block 49 is supported in the chamber 50 upon a pair of spaced-apart studs 62, being rigidly anchored thereto as by means of screws 64. The lamp chambers 51, one of which is illustrated in section in Fig. 6, resemble somewhat closely the chambers 41 of the upper end casing 14. Thus, the upper wall of each of the chambers 51 is formed with an enlarged bore 65 terminating in an annular shoulder 66 against which the lower end of the protective tube 18 abuttingly engages. The shoulder 66 is also arranged to support a plurality of lamp centering springs (not shown) similar to the springs 34. The bore 65 is suitably sealed with respect to the tube 18 as by means of a lead sealing ring 68 resembling the rings 35 used in the casing 14. The bottom wall of each of the chambers 51 is thickened and provided with a threaded bore 69 which receives a handhole plug 70 similar in character to the plugs 38 and 58.

Provision is made in the structure of the lower end casing 15 for sealing the incoming electrical supply leads L1, L2 from the potentially arcing portions of the fixture 10. This is accomplished in the present instance by the use of an internal sealing arrangement (See Figs. 3, 4, 5, and 7) which completely isolates the terminal chamber 50 from the fixture so as to preclude the ingress or egress of gas or flame without interfering with the electrical wiring communicating between the compartments of the fixture. Thus the internal partition walls separating the chamber 50 from the lamp chambers 51 are formed with wireways 71 each having a central portion 72 of relatively larger cross section than the end portions thereof. Tightly contained within each of the portions 72 and firmly enveloping the electrical wiring passing therethrough are a pair of sealing plugs 74 which preclude the passage of flame or gas pressure between the chambers 50 and 51. As indicated in Fig. 7, the axial bore of the hollow boss 55 is provided with a pair of spaced apart, annular shoulders 75, defining therebetween a sealing well 76 adapted to receive a third sealing plug 78. The latter, like the plugs 74, constitutes a gas tight and flame tight seal between the wiring running therethrough and the walls of the sealing well 76, thereby effectively isolating the terminal chamber 50 from the interior of the hollow strut 16 and from communication with the switch chamber 42 of the upper end casing 14.

For the purpose of dissipating any gas pressure which might occur in any of the internal chambers of the fixture without permitting the leakage of flame from the latter, an interesting means is provided. In the illustrative fixture, such means comprises a rigid porous metallic disk or plate 79 unitary with each of the handhole plugs 38, 58, and 70. Each of the disks 79 is of appropriate thickness to withstand the sharp rise in pressure within the fixture incident to an explosion due, for example, to arcing in one or more of its various electrical components. Such pressure can be quickly equalized with that of the surrounding atmosphere via a plurality of tortuous, flame arresting paths defined within the porous structure of the disk metal itself. Accordingly, pressure originating within the terminal chamber 50 of the lower end casing is relieved through the handhole plug 58. Pressures originating within the lamp chambers 41 and 51 of each casing are respectively relieved by means of the handhole plugs 38 and 70. Since the switch chamber 42 of the upper end casing and the ballast chamber 52 of the lower end casing communicate freely with the lamp chambers of their respective casings, pressures occuring within the chambers 42 and 52 are relieved via the handhole plugs 38 and 70.

In order to facilitate rapid relamping of the fixture 10 and also to render the lamp starter units S readily accessible upon removal of the handhole plugs 38, a supporting device is provided for the fixture in the form of a gas and flame tight swivel fitting 80. In the illustrative embodiment of the invention, the fitting 80 (Figs. 2, 3, and 4) is rigidly fixed to the bottom wall 22 of the cabinet 11, projecting therethrough and serving as a service entrance for the supply leads L1, L2. Under normal circumstances, the fixture 10 stands in an upright position within the cabinet 11, resting its weight upon the fitting 80 and being retained in the upright position by means of a spring clamp 81 or the like. In the event that replacement of a lamp or a starter unit should become necessary, the individual servicing the fixture has only to remove the switch handle 46 and the front panel 25 of the cabinet. Both of these operations can be accomplished merely by a few turns of a screwdriver. After the foregoing parts have been removed, the fixture may then be pulled manually out of engagement with the clamp 81 and swung outwardly upon the fitting 80 to an inclined position such as that indicated in dot dash lines in Fig. 3, whereupon the parts in question can be reached by unscrewing one or both of the handhole plugs 38. On the other hand, if the interior of the lower end casing should happen to require attention, access may readily be had to the same by removal of the plugs 58, 70, or the ballast chamber cover 54 after first removing the panel 25.

Although the particular electrical circuit employed in the fixture 10 is of a rather conventional nature, such circuit has been illustrated diagrammatically in Fig. 8 to bring out the relationship between the internal seals 74, 78 and the fixture wiring. Thus the seal 74 between the terminal chamber 50 and the left hand lamp chamber 51 contains one wire, while its counterpart on the other side contains two wires. By the same token, all three wires running from the lower end casing 15 to the upper end casing 14 via the hollow strut 16 are tightly encased in the sealing plug 78.

Oath, Power of Attorney, and Petition

Being duly sworn, I, Nils A. Tornblom, depose and say that I am a citizen of the United States, residing at Chicago, Cook County, Illinois; that I have read the foregoing specification and claims and I verily believe I am the original, first, and sole inventor of the invention or discovery in Explosionproof Light Fixture of the Vented Type described and claimed therein; that I do not know and do not believe that this invention was ever known or used before my invention or discovery thereof, or patented or described in any printed publication in any country before my invention or discovery thereof, or more than one year prior to this application, or in public use or on sale in the United States for more than one year prior to this application; that this invention or discovery has not been patented in any country foreign to the United States on an application filed by me or my legal representatives or assigns more than twelve months before this application; and that no application for patent on this invention or discovery has been filed by me or my representatives or assigns in any country foreign to the United States.

And I hereby appoint Carlson, Pitzner, Hubbard & Wolfe, One North LaSalle Street, Chicago 2, Illinois, Registration No. 501, my attorneys with full power of substitution and revocation, to prosecute this application and to transact all business in the Patent Office connected therewith.

Wherefore I pray that Letters Patent be granted to me for the invention or discovery described and claimed in the foregoing specification and claims, and I hereby subscribe my name to the foregoing specification and claims, oath, power of attorney, and this petition, this 2nd day of December, 1947.

Inventor: /s/ Nils A. Tornblom
Post Office Address:
c/o Appleton Electric Company
1713 West Wellington Avenue
Chicago, Ilnois

State of Illinois
County of Cook
ss:

Before me personally appeared Nils A. Tornblom to me known to be the person described in the above application for patent, who signed the foregoing instrument in my presence, and made oath before me to the allegations set forth therein as being under oath, on the day and year aforesaid.

/s/ Christine Thelin
Notary Public

My commission expires November 11, 1949.

(Notary's Seal)

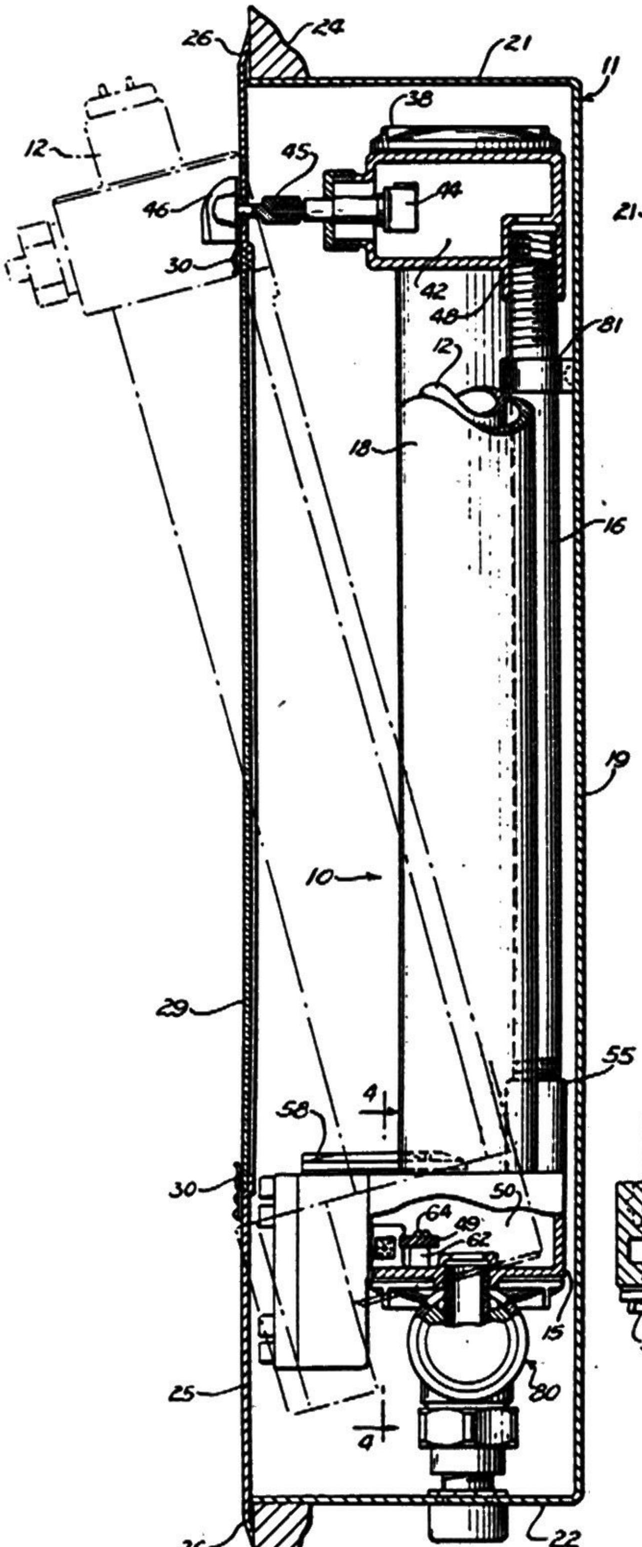

Fig. 3

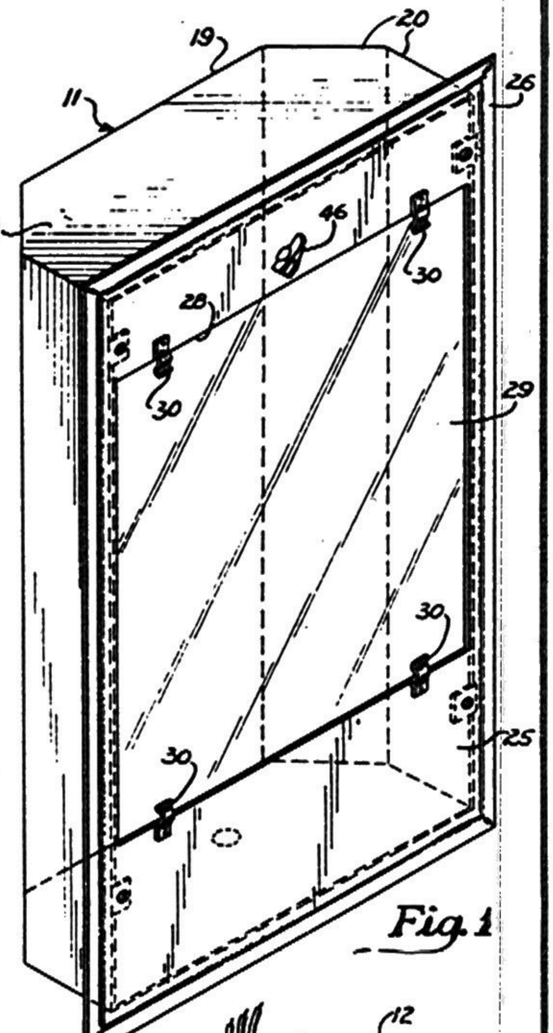

Fig. 1

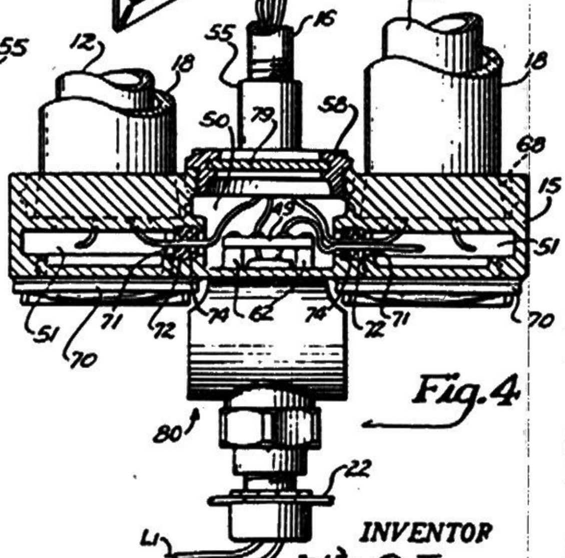

Fig. 4

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attys.

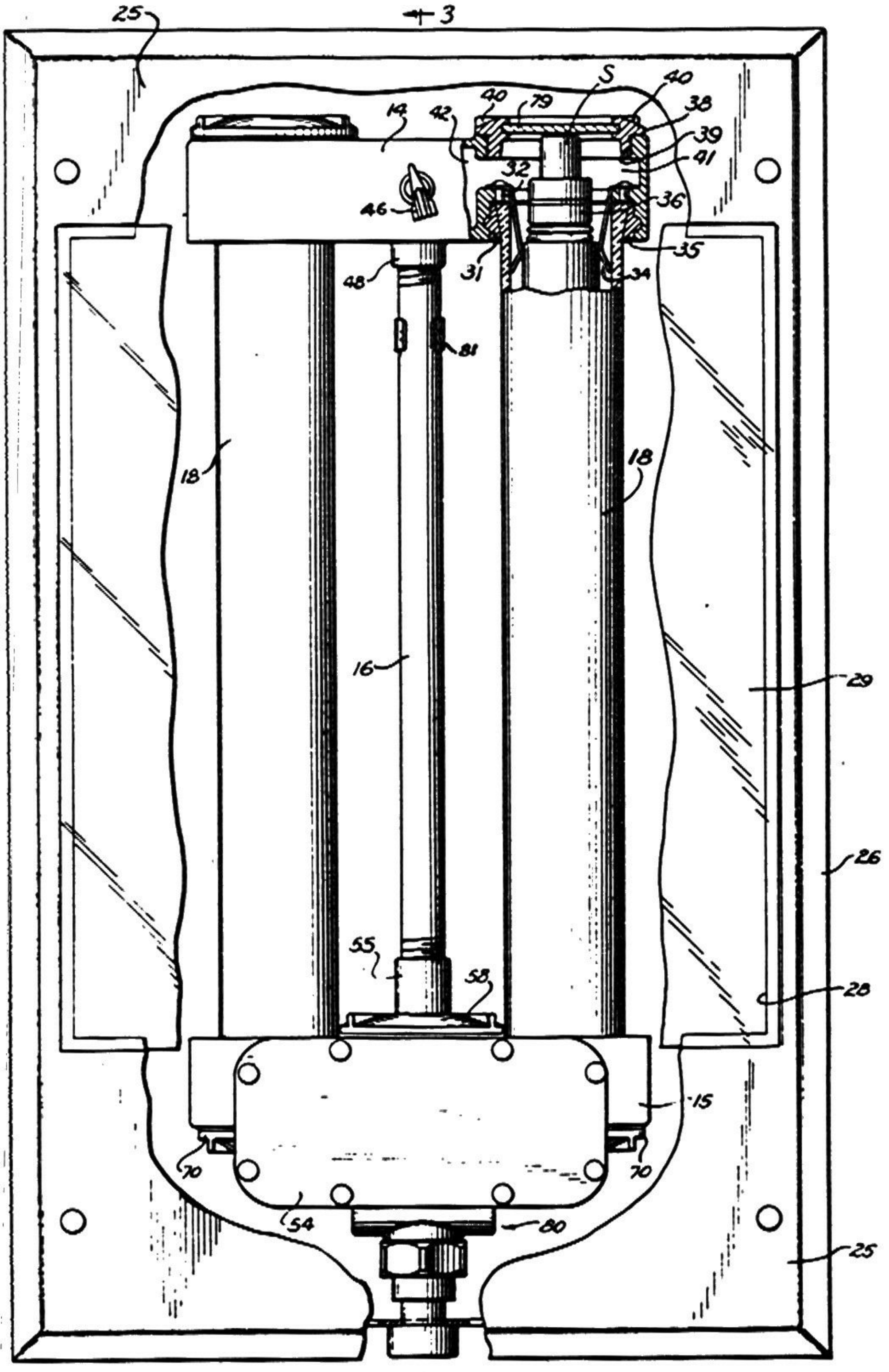

Fig.2

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Attys.

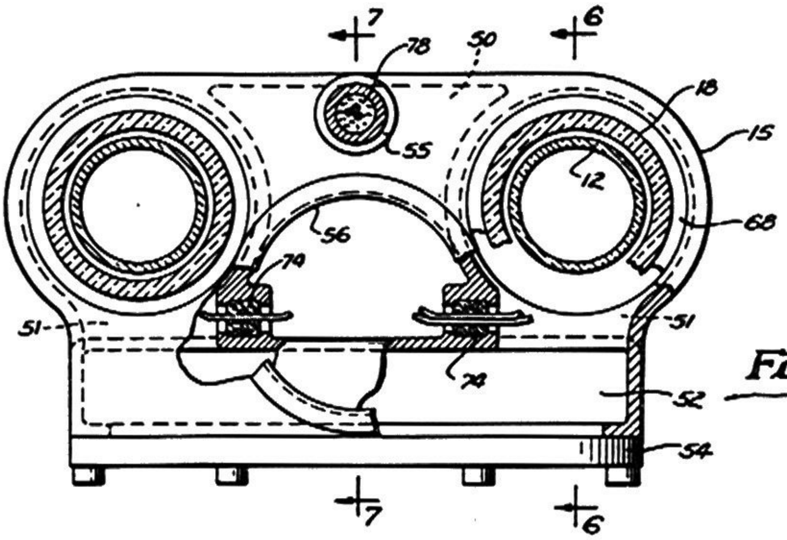
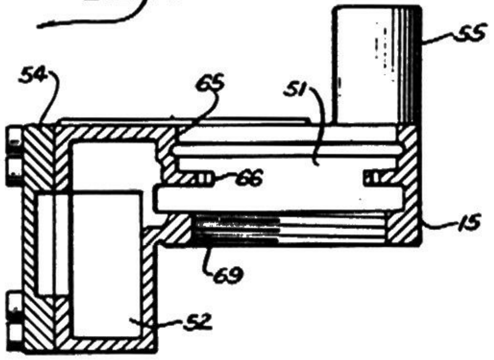


Fig.5

Fig.6



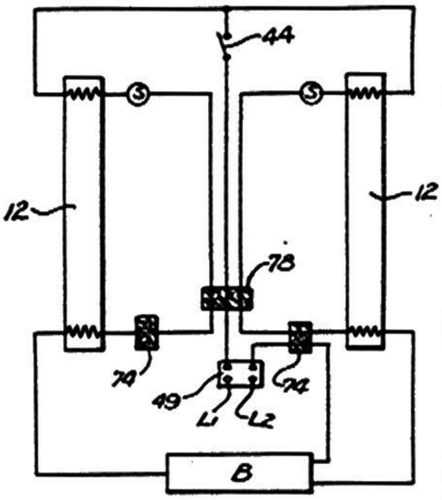
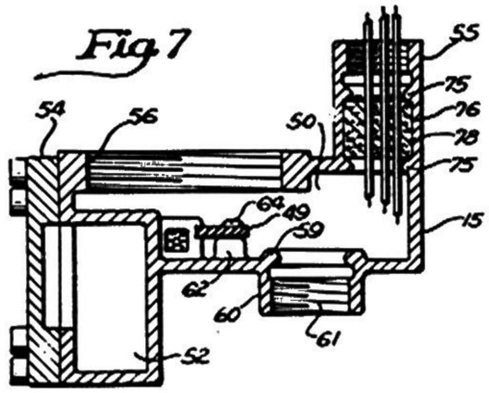


Fig.8

Fig.7



INVENTOR.
Nils A. Tornblom

BY

Carlson, Pitzner, Hubbard & Wolfe
Attys.

20

(No Model.)

J. L. WILLIAMS.

SAFETY LAMP.

No. 321,166. Patented June 30, 1885.

Fig. 1.

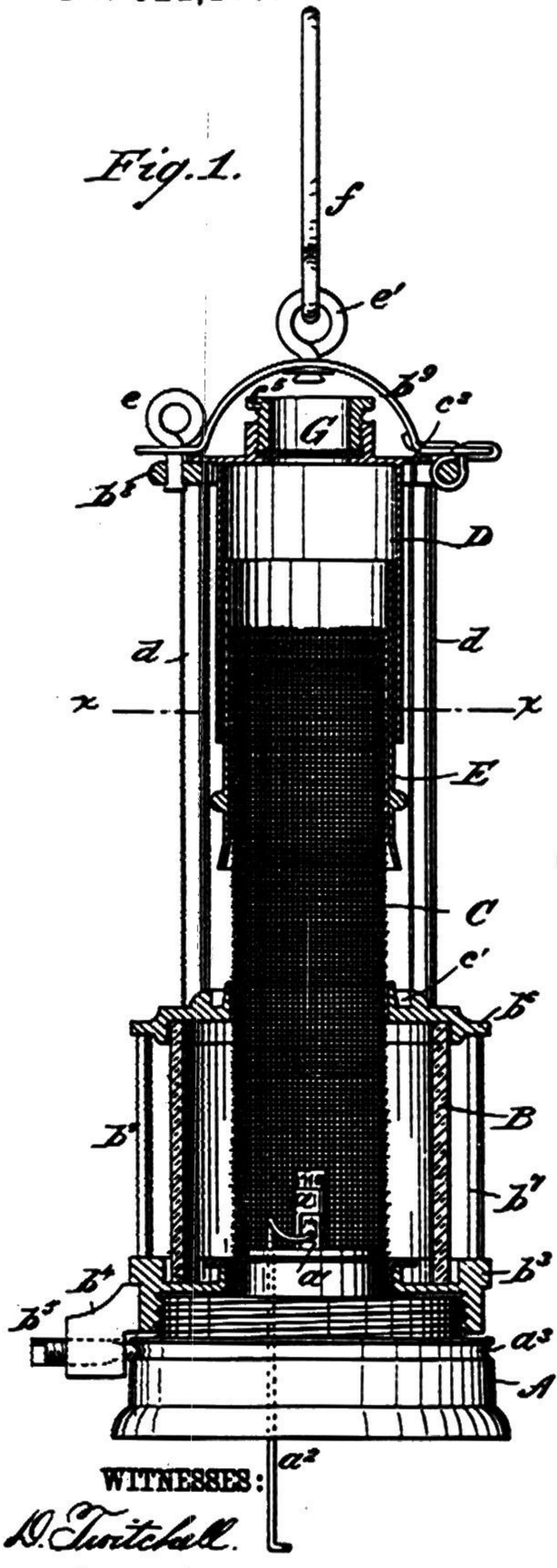


Fig. 3.

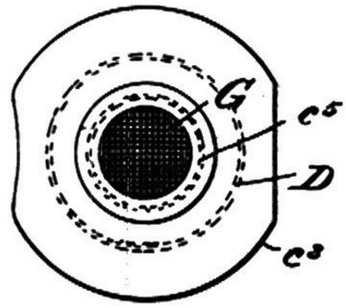
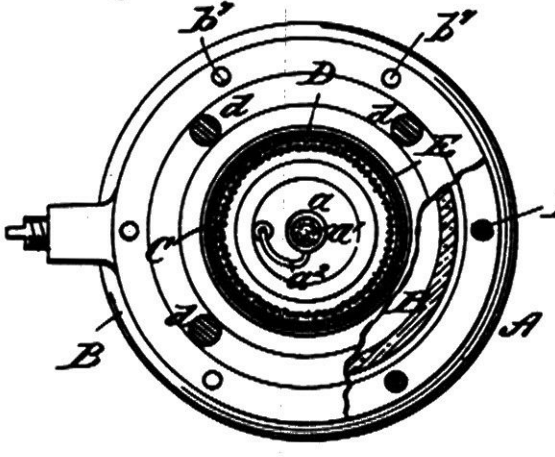


Fig. 2.



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UNITED STATES PATENT OFFICE.

JOHN LLOYD WILLIAMS, OF SHENANDOAH, PENNSYLVANIA.

SAFETY-LAMP.

SPECIFICATION forming part of Letters Patent No. 321,166, dated June 30, 1885.

Application filed January 24, 1885. (No model.)

To all whom it may concern:

Be it known that I, JOHN LLOYD WILLIAMS, of Shenandoah, in the county of Schuylkill and State of Pennsylvania, have invented certain new and useful Improvements in Safety-Lamps, of which the following is a full, clear, and exact description.

This invention relates to safety-lamps of the Davy description, for use in mines and other places in which there is explosive gas; and it consists in certain novel attachments and combinations of parts, all as hereinafter fully described, and pointed out in the claims, arranged outside of the wire-gauze cylinder of the lamp, which extinguisher may be used in addition to an adjustable sleeve on the wick-tube to afford double safety against a rush of gas at any time into the lamp; also, including an extension of the gauze cylinder the full length of the lamp below the burner thereof, and inside of an inclosing glass or transparent cylinder or case, whereby additional safety is secured and a better light obtained; likewise, including an additional wire-gauze protector at the top of the lamp, at a distance from and above the top of the gauze cylinder, for the purpose of giving additional security, all substantially as herein described.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 represents a mainly sectional elevation of a safety-lamp embodying my invention; Fig. 2, a partly broken horizontal section of the same on the line $x\,x$ in Fig. 1; and Fig. 3, a plan or top view of the cap-piece or upper sleeve of the lamp with supplementary wire gauze therein and means for securing and removing the same.

The invention is applicable not only to the ordinary Davy lamp, but to other lamps of similar character known as improvements thereon, it being as sensitive to gas as a perfect Davy lamp, and gives as good a light as others which are an improvement thereon. In some cases only certain of the novel features may be separately used, and in others all or any number of them may be combined.

In applying the invention to an ordinary Davy lamp, the extinguishing-sleeve on the outside of the gauze cylinder may be arranged to slide up and down over an upper fixed sleeve instead of within it. I however will proceed to describe the lamp in one of its most improved forms, combining the several features of the invention.

A is the base of the lamp, which also constitutes the oil-reservoir, and up above which the slotted wick-tube a, holding the wick a', projects, as also a wick-lifter, a^2, capable of operation from beneath the base. The base A screws at its upper end into a cupped lower ring, b^3, of the main frame, and may be locked therein by an adjusting-screw, b^5, arranged to pass through and engage with a lug, b^4, on one side of said ring, and to bear against or within a groove, a^3, in and around the base A. This ring b^3 is connected by a cage of rods, b^7, with a second upper cupped ring or plate, b^6, between which and the ring b^3 a glass or transparent cylinder or case, B, is inclosed.

C is the wire-gauze cylinder of the lamp arranged to extend through the ring b^6 down to the bottom of the lamp below the burner and within the glass cylinder B. Said gauze cylinder, which is closed at its upper end by an extension of the wire-gauze as usual, projects above the ring b^6 to the usual or any suitable height. The upper portion of the lamp consists, in part, of a ring, b^8, connected with the ring b^6 by the usual cage of rods d, and having mounted on it a hinged hood, b^9, secured, when closed, by a turn-catch, e, and having attached to it a swiveled eye, e', to which the handle f of the lamp is secured.

Fitting down through the upper ring, b^8, of the frame of the lamp is an upper sleeve, D, provided with a centrally-perforated top or cap piece, c^3, which sits down on the top of the ring b^8. This sleeve, which is thus made removable through the top of the lamp, is of somewhat greater diameter than the gauze cylinder C, and may extend to any desired distance below its top, and serves to receive up through and within it and between it and the gauze cylinder C a telescopic extinguisher or lower sleeve, E. These sleeves D and E may be of any desired length, but should be so proportioned or arranged that, on drawing the lower sleeve, E, fully down, the combined sleeves will wholly inclose the sides of the gauze cylinder C above the ring b^6 or space between the rings b^6 and b^8, and so exclude air or gas from entering. When the sleeve E is fully down to extinguish the lamp, its lower end is made to enter a groove, c', in the top of the ring b^6, and thus makes a closer joint.

Arranged above the top of the gauze cylinder C, at some distance from it, within a socket on top of the cap-piece c^3, is a wire-gauze diaphragm, G, sufficiently large to cover the central aperture in said cap-piece, and held down to its place by a screw-gland, c^5, made to engage with the socket. This wire-gauze diaphragm G, which, being fitted as described, can be readily changed by unscrewing the gland c^5, gives additional safety to the lamp, as, in case of the top of the gauze-cylinder C getting burned or injured at any time, and its condition not being noticed, the gauze G would prevent the gas from passing through, thus avoiding an explosion.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with the base of the lamp, its wick-tube, and a glass-cylinder at the lower part of the lamp, of a wire-gauze cylinder extending down within the said cylinder, a stationary sleeve projecting downward from the upper part of the lamp, and a sliding sleeve on the said wire-gauze cylinder, substantially as herein shown and described.

2. The combination, with the base of a lamp, the ring b^6, supported above the same, the glass cylinder between said base and ring, and the wire-gauze cylinder C, projecting down through the ring of the ring b^8, supported above the ring b^6, the sleeve D, depending from the ring b^8, and the sliding sleeve E, substantially as herein shown and described.

3. The combination, with the base of the lamp, the stationary sleeve D, and the sliding sleeve E, of the ring b^6, supported above the base and provided with the annular groove c', to receive the lower end of the sliding sleeve, and the wire-gauze cylinder C, projecting through the said ring, substantially as herein shown and described.

4. The upper sleeve, D, with its perforated cap-piece c^3, in combination with the wire-gauze G, arranged to cover the perforation in said cap-piece, a screw-socket adapted to receive said gauze, and the screw-gland c^5 for holding said gauze in place and to provide for its removal from the lamp, substantially as specified.

JOHN LLOYD WILLIAMS.

Witnesses:
WILLIAM BENT,
L. J. ELLIS.

23

(No Model.)

A. KEIL.

ELECTRIC LANTERN.

No. 489,150. Patented Jan. 3, 1893.

Fig. 1.

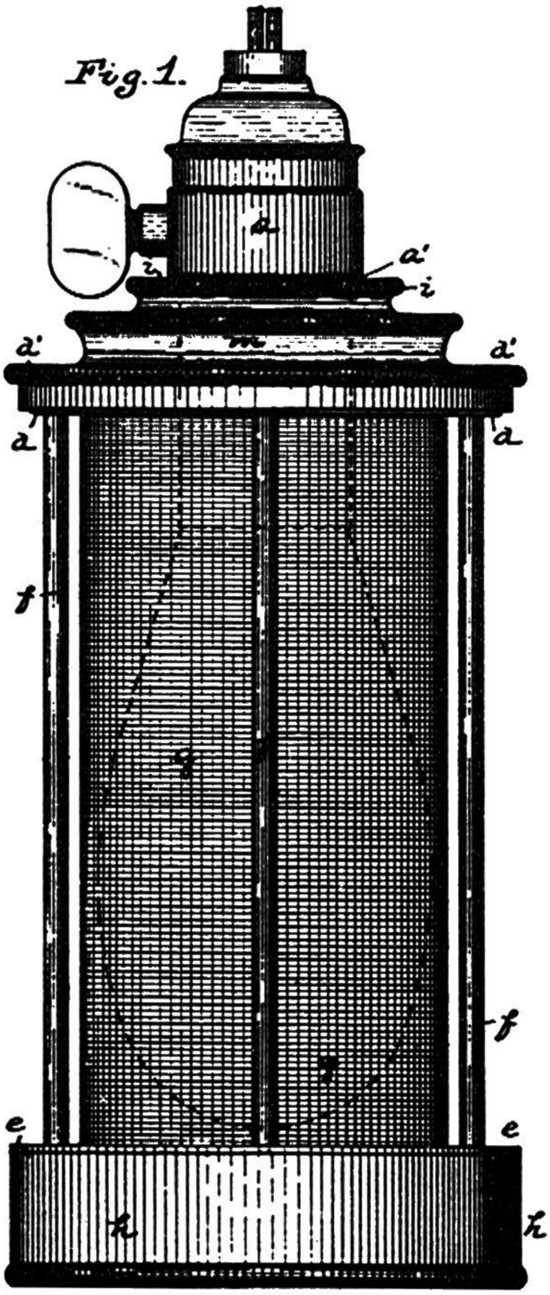
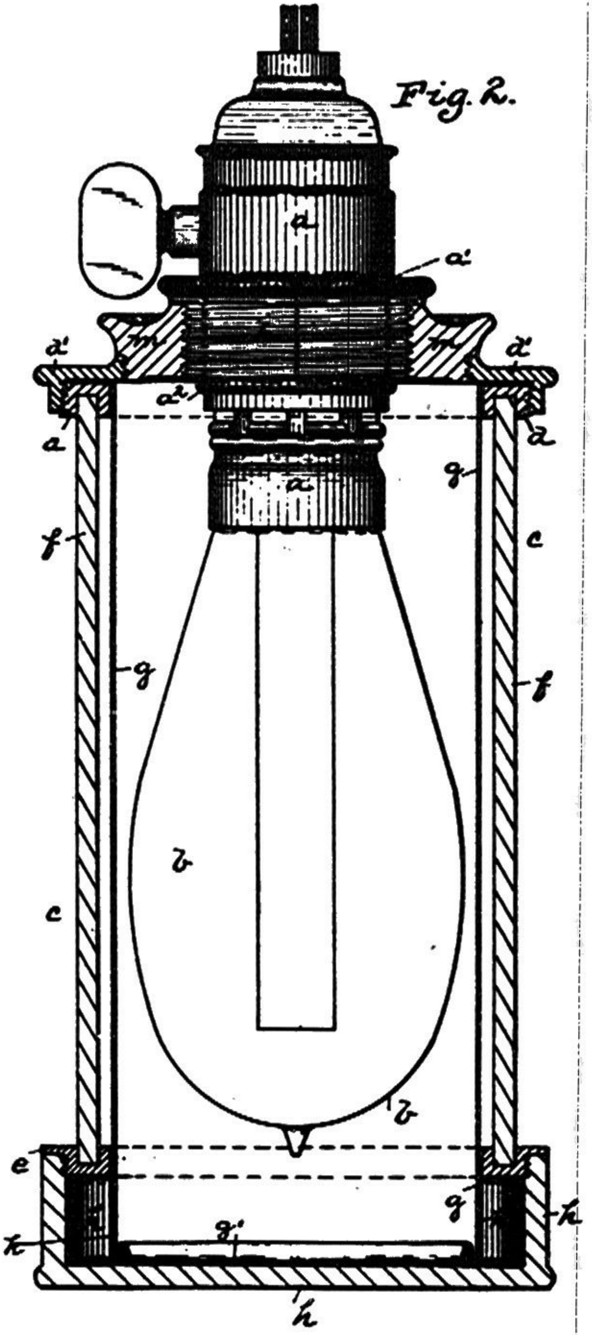


Fig. 2.



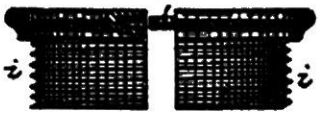


Fig. 3.

Witnesses:

J. N. Cooke.

F. G. Kay

Inventor:

Adam Keil

By James D. Kay

Attorney

UNITED STATES PATENT OFFICE.

ADAM KEIL, OF McKEESPORT, PENNSYLVANIA.

ELECTRIC LANTERN.

SPECIFICATION forming part of Letters Patent No. 489,150, dated January 3, 1893.

Application filed May 11, 1891. Serial No. 392,326. (No model.)

To all whom it may concern:

Be it known that I, ADAM KEIL, a resident of McKeesport, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Electric Lanterns; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to lanterns for use in mines and like places, with incandescent electric lights, its object being to provide a strong and substantial lantern to support the bulb and its holder, and protect it from injury by blows, while the light may be employed in any part of the mine with which electric connection can be made, and in case of the breaking or cracking of the bulb all fear of the igniting of any dangerous gases within the mine, will be precluded.

To these ends my invention consists in certain improvements and combinations of parts, all of which will be fully hereinafter set forth and claimed.

To enable others skilled in the art to make and use my invention, I will describe the same more fully referring to the accompanying drawings, in which

Figure 1 is a side view of my improved lantern; Fig. 2 is a sectional view showing the bulb within the lantern and illustrating the manner of connecting the bulb holder and lantern; and Fig. 3 is a side view of the sectional ring, partly in section.

Like letters of reference indicate like parts in each of the figures.

The bulb holder *a* can be of any suitable construction and the bulb *b* depending from the holder within the lantern may be of any suitable form. The frame *c* of this lantern is formed of the top ring *d*, the bottom ring *e* and the bars *f* extending between said rings so as to give it a rigid body. Where the inclosing body *g* is formed of wire gauze, it extends through between said rings and is flanged out over the top ring *d* and is clamped in place by the cap ring *d'* which screws onto the top ring *d*. This wire gauze body *g* is also closed at its lower end by the wire disk *g'* which may be formed integral therewith and this disk is inclosed within the base piece *h* which screws onto the bottom ring *e*, so firmly inclosing the base of the gauze body. At the same time as it is extremely desirable to prevent the passage of flame from the lantern in case of the ignition of the gases therein, I prefer to employ a supplemental gauze cap *k* within the base piece *h* and fitting around the disk *g'*, of the gauze body, (thereby providing a gauze body with two thicknesses of material for its base) and so entirely precluding the passage of any such flame or spark in case of the breaking of the bulb and the ignition of any gas within the lantern in consequence thereof. At the same time the base piece *h* forms a solid and substantial base on which the lantern may rest. It is also necessary to form a substantial and gas tight connection between the bulb holder and the lantern and to insure a tight joint between the same so that it is necessary to have some construction which will engage with the bulb holder without the necessity of passing over or around the bulb. To accomplish this I employ a sectional or partible ring *i* which, as illustrated, is formed in two pieces which fit around the annular seat *a'* of the bulb holder just above the shoulder a^2 the outer face of such sectional ring being threaded and a screw ring *m* screwing onto such sectional ring and binding it onto the bulb holder. The edges of the two parts of the sectional ring fit against each other and in order to hold them in line, I employ pins n^2 on one section, fitting into seats on the other section, so drawing the two parts of the ring into such position that the threads on the outer surface of the ring will coincide. When the screw ring *m* is secured around the sectional ring, it binds the two parts thereof together and at the same time it provides a ring of greater diameter than the largest portion of the bulb to screw into the cap ring *d'* and so provide a means of entering the bulb into and securing it within the lantern body. The sizes and shapes of the different parts may of course, be varied according to the different bulbs or bulb holders which are to be employed with the lamp.

In employing the lantern as above described, the operator before the bulb is secured within the bulb holder, places the sectional ring *i* around the seat *a'* of the bulb holder and above the shoulder a^2 thereof, the pins n^2 in one section entering the seats in the other section of the ring, he then screws around such section ring the screw ring *m*, so securing the sectional ring around the bulb holder. The bulb is then connected to the bulb holder in the usual way, and the bulb is passed down into the lantern, the entrance through the top ring and its ring cap being large enough to permit the bulb to enter the lantern. He then screws the ring *m* into the top ring or its ring cap and so secures the bulb within the lantern. The lantern may be employed in any desired way, either within the hallways of the mine or within the rooms where the work is being done, being either hung by the cords carrying the wires of the incandescent lamp, or supported on its base piece. When mining, the operator can place it upon the floor of the mine, or can hang it in the mine, and in case it is turned over and meets with any hard usage, the body of the lantern is of sufficient strength to entirely protect the fragile bulb and prevent fracture thereof by blows; while at the same time, the lantern may be swung by the operator as may be found necessary and danger of injury to the bulb in case the lantern comes in contact with any hard surface, is prevented. He may also, as found necessary, pass the same into the kerf or cutting without fear of injury to the lantern, this being necessary under some circumstances in the ordinary operations of mining. In case the lantern body should be crushed by any severe accident happening thereto by which the bulb would be cracked or broken, and cause the ignition of any gases which might be within the lantern body by the spark of the incandescent light all liability of ignition of surrounding gases so as to cause an explosion, would be prevented by the gauze body of the lantern, so that the liability of the ignition of the gases is precluded under any circumstances. The lantern may be employed in this way for any length permitted by the connecting cords carrying the wires, and a much more brilliant light and safer light than has heretofore been found practibable to be used in mines, is obtained; while the fouling of the air of the mine by the miners' lamps is prevented. The lantern may of course be employed for other purposes, and in case it is desired to employ a glass body portion instead of the gauze body portion, the glass may be secured within the frame and seated therein, in any suitable way. If such lantern is employed in a mine, the ends of the glass body would of course be seated against rubber or like rings so as to preclude the passage of any gases into the lantern.

What I claim as my invention and desire to secure by Letters Patent, is:

1. In combination with an incandescent lamp bulb and its holder, a sectional ring fitting around the holder and having a threaded outer surface, a screw ring around the sectional ring, and an inclosing lantern body fitting around the bulb and engaging with the screw ring, substantially as and for the purposes set forth.

2. The combination with an incandescent lamp bulb and its holder, of the sectional ring *i* having a threaded outer surface the screw ring *m* screwing thereon and the lamp body having the top ring *d* and bottom ring *e* connected by the bars *f*, and a threaded connection between said screw ring and said top ring, substantially as and for the purposes set forth.

In testimony whereof I, the said ADAM KEIL, have hereunto set my hand.

ADAM KEIL.

Witnesses:
J. N. COOKE,
ROBT. D. TOTTEN.

N° 23,369 A.D. 1897

Date of Application, 11th Oct., 1897 --Accepted, 11th Dec., 1897

COMPLETE SPECIFICATION.

"An Improvement in Electric Safety Fuses."

We, HENRY CHARLES GOVER, Secretary of the Edison and Swan United Electric Light Company Limited, and CHARLES FARADAY PROCTOR, Electrician, both of 36 Queen Street, Cannon Street, in the City of London, do hereby declare the nature of this invention and in what manner the same is to be performed to be particularly described and ascertained in and by the following statement:

The casing of an electric safety fuse is frequently made with an opening for escape of gases when the fuse gives way. Should the fuse happen to be near combustible materials or gases there is danger of these being ignited by the burning of the fuse or the temporary arc produced at the moment of its fusion.

The present invention has for its object to provide against this danger, by arranging the fuse and its casing as we shall describe referring to the accompanying drawing.

Fig. 1 is a section partly in elevation and Fig. 2 is a plan with the casing removed.

On a base B of insulating material are fixed the two terminals T T¹ connected by the fuse wire or strip F which is bent round a projecting piece P of insulating material hollowed out behind the fuse.

The casing C has a large opening at the top covered with wire gauze W such as is employed in a miners safety lamp, or other pervious material such as will give a free outlet for gases under pressure but will prevent communication of flame to the exterior.

Having now particularly described and ascertained the nature of this invention and in what manner the same is to be performed, we declare that what we claim is:—

An electric safety fuse having a large opening from its casing covered by wire gauze, or equivalent pervious material, substantially as and for the purpose set forth.

Dated this 11th day of October 1897.

ABEL & IMRAY
Agents for the Applicants.

Redhill: Printed for Her Majesty's Stationery Office, by Malcomson & Co., Ltd. 1897

[*Price 8d.*]

A.D. 1897. Oct. 11. No. 23,369.

COVER & *another's* Complete Specification.

(1 SHEET)

Fig. 1.

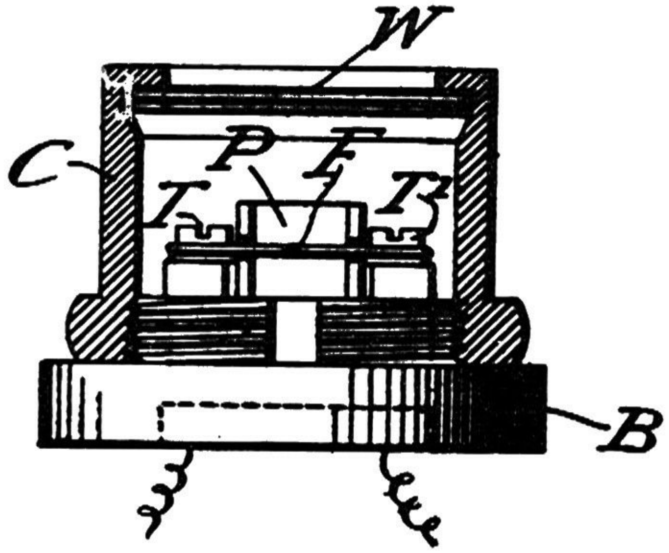
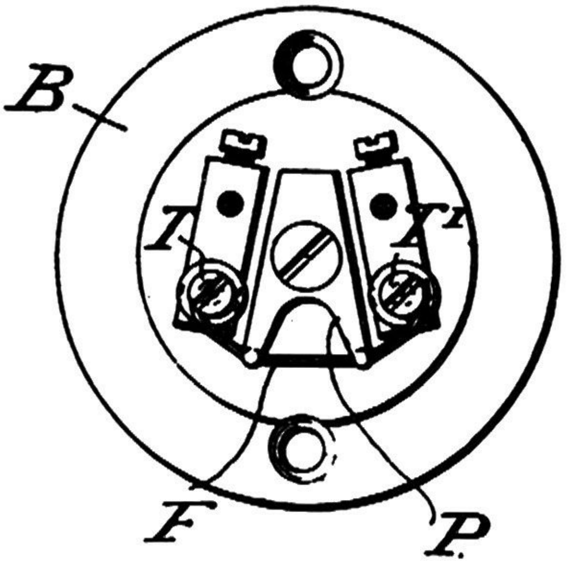


Fig. 2.



[This Drawing is a full-size reproduction of the Original

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Jan. 1, 1946. N. A. TORNBLOM **2,392,202**

EXPLOSIONPROOF LIGHTING FIXTURE

Filed July 24, 1942 2 Sheets-Sheet 1

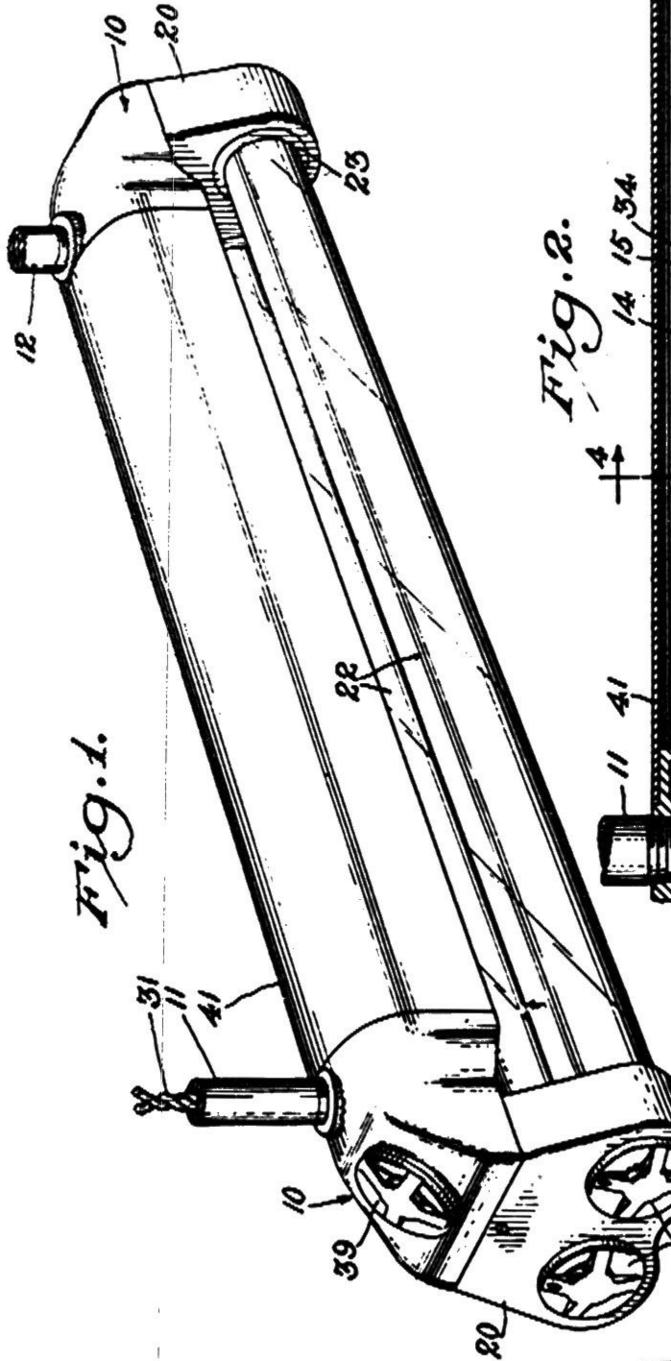


Fig. 1.

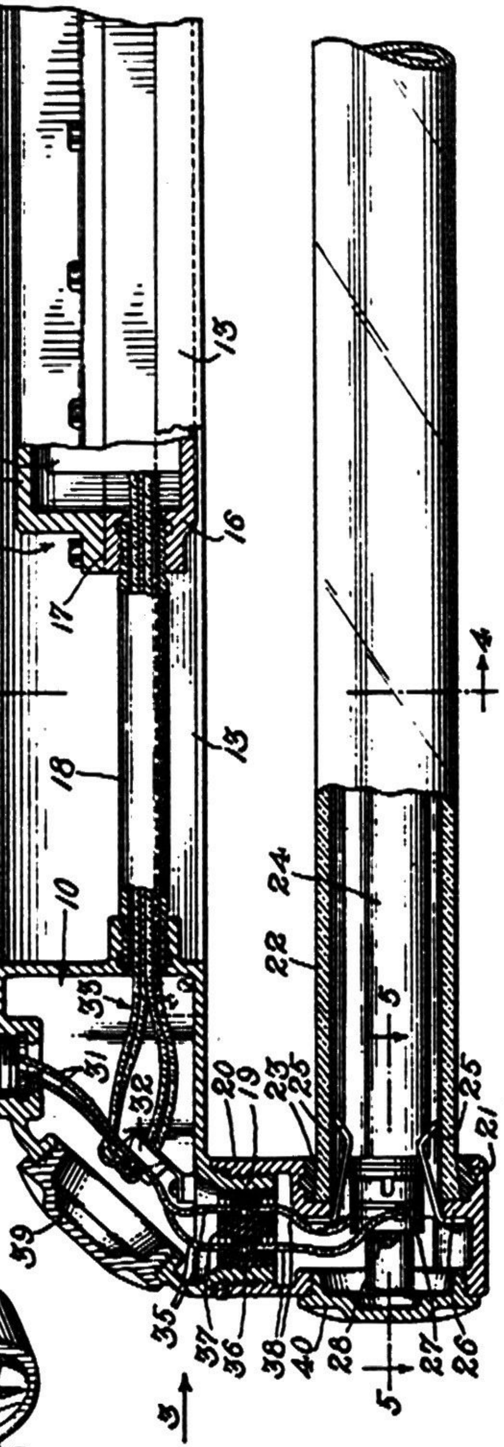


Fig. 2.

Inventor
Nils A. Tornblom
By
Parker, Carlson, Pitzner & Hubbard.
Attorneys.

29

Jan. 1, 1946. N. A. TORNBLOM **2,392,202**

EXPLOSIONPROOF LIGHTING FIXTURE

Filed July 24, 1942 2 Sheets-Sheet 2

Fig. 3.

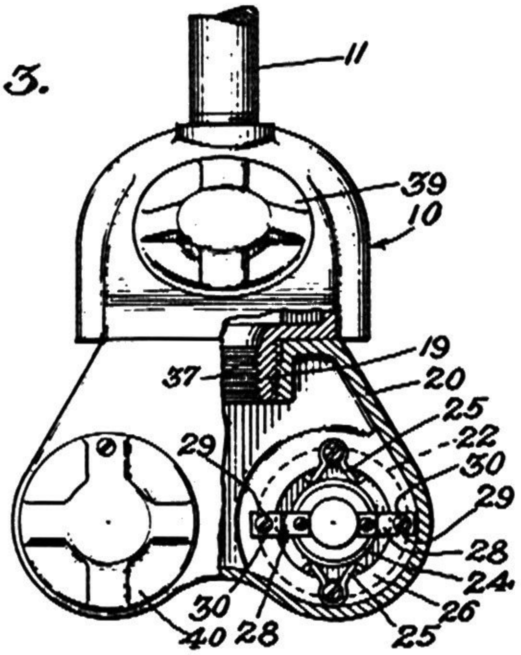


Fig. 4.

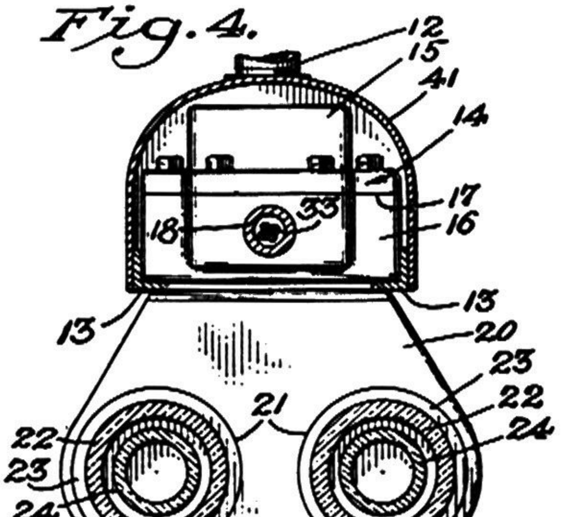
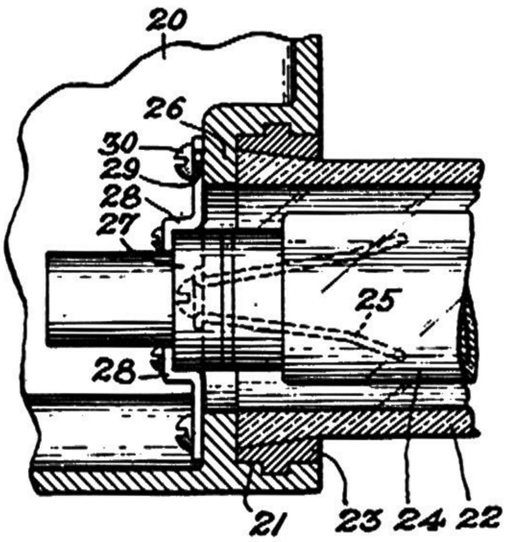


Fig. 5.



Inventor
Nils A. Tornblom
BY
Parker, Carlson, Pitzner & Hubbard
Attorneys.

Patented Jan. 1, 1946 **2,392,202**

UNITED STATES PATENT OFFICE

2,392,202

EXPLOSIONPROOF LIGHTING FIXTURE

Nils A. Tornblom, Chicago, Ill., assignor to Appleton Electric Company, Chicago, Ill., a corporation of Illinois

Application July 24, 1942, Serial No. 452,154

3 Claims. (Cl. 240—11.2)

My invention relates generally to an explosionproof lighting fixture for supporting one or more gas or vapor-filled tubes which are rendered luminous by the passage of an electrical discharge therethrough and more particularly to a fluorescent tube fixture.

An illuminating device of this character customarily employs a so-called starting switch which short circuits the lamp for a few seconds during which the current, appropriately limited in magnitude, flows through the cathode; thereafter the starter automatically opens the shunt circuit and creates an inductive surge which sets up the arc. When such lamps are used in an atmosphere containing an inflammable or explosive gas or dust, it is important that the design of the lamp prevent the exposure of sparks to the explosive atmosphere and also the transmission to the atmosphere of any flame occurring in parts of the fixture.

It is therefore one object of my invention to provide a fixture of the character indicated in which the potentially arcing portions are completely housed and so segregated from the surrounding atmosphere that inflammable gases therein can not be ignited either by arcing or the ignition of gases occurring within the fixture.

A further object is to devise a fixture wherein provision is made for absorbing or cushioning gas explosions occurring in the fixture thus preventing damage to the lighting tube and strain on the fixture.

These and further objects of my invention will be set forth in the following specification, reference being had to the accompanying drawings, and the novel means by which said objects are effectuated will be definitely pointed out in the claims.

In the drawings:

Figure 1 is a perspective view of my improved fixture.

Fig. 2 is a vertical sectional elevation of one end of the fixture.

Fig. 3 is an end view partly in section looking in the direction of the arrow 3 in Fig. 2.

Figs. 4 and 5 are sections along the lines 4—4 and 5—5, respectively, in Fig. 2 showing certain details of construction.

In describing the fixture, it will be understood that the construction shown in Fig. 2 is duplicated at the other end of the fixture except for certain presently noted features, not forming part of the invention, and that the fixture may be arranged for any number of lighting tubes, including one tube, instead of the two tubes actually illustrated.

Referring to Fig. 2, the numeral 10 designates a hollow end casing which is supported from a ceiling fixture (not shown) by a pipe 11, a similar pipe 12 supporting the other end casing 10 from a similar ceiling fixture. The lower ends of the pipes 11 and 12 are threaded in the casings 10 and bridged between and secured to these casings is a pair of struts in the form of angle irons 13 which support a transformer housing 14. The housing 14 is composed of the separable parts 15 and 16 whose abutting faces are preferably ground to form smooth surfaces 17 for a purpose presently explained. Each end of the housing 14 is threadedly connected to one end of a conduit 18 whose opposite end is also threadedly connected to a casing 10. An externally and internally threaded extension 19 depends from the underside of the casing 10 and externally secured thereto is an end support 20 whose inner wall is recessed in two locations as at 21 to receive the externally flared ends of sleeves 22 that are secured and sealedly connected to the support 20 by means of lead sealing rings 23 appropriately locked to the support 20. Each sleeve 22 is preferably composed of a heat resistant glass, such as Pyrex, and is light-pervious, being transparent, translucent or colored as desired.

A fluorescent lighting tube 24 of conventional design extends through each sleeve 22 and is supported in spaced relation thereto by means of a plurality of spring fingers 25 whose free ends engage the outer and inner surfaces of the tube 24 and sleeve 22, respectively, the fixed ends of the fingers being secured to an apertured wall 26 forming the base of the recess 21. The foregoing structure is duplicated at the opposite end of the fixture.

A starter 27 of conventional design is secured to one end of the tube 24 and electrically connected in the usual manner to one of the tube electrodes (not shown) and a plurality of radial stop fingers 28 have their inner ends secured to the starter and their outer ends slotted as at 29 (see Figs. 3 and 5) for engagement with suitable headed fastenings 30 which are mounted in the wall 26. These fingers are engaged with the fastenings when the starter is mounted in the tube end and their purpose is to prevent endwise movement of the tube.

The electric circuit which is also conventional forms no part of the present invention and hence has not been particularly illustrated or described. For present purposes, it will be understood that line conductors 31 may be introduced into a casing 10 through the pipe 11 for attachment to a connector block 32 and from this block conductors, indicated generally by the numeral 33, may lead to and from the primary and secondary of a transformer 34 within the housing 14 through the conduits 18. Similarly, conductors 35 extend from the block 32 and have their ends soldered or otherwise secured to metal connectors 36 which are threaded in an insulating plug 37, the latter in turn being threaded in the internally threaded portion of the extension 19. The ends of a pair of conductors 38 are also soldered or otherwise secured to the connectors 36 and their opposite ends to the starter 27. It will be understood that an insulating plug similar to the plug 37 is employed in a similar location at the other end of the fixture and conductors similar ot the conductors 38 are connected to an electrode (not shown) which is mounted in the opposite end of the tube 24. Handhole covers 39 and 40 are threadedly mounted in convenient wall portions of the casing 10 and support 20 in order to facilitate the attachment of the wires and for other purposes. A hood 41 may be connected to the casings 10 to provide a decorative and dust cover for the housing 14 and sleeves 22.

From the foregoing, it will be apparent that the interiors of the casings 10, housing 14 and conduits 18 are in communication with each other and form in effect a single enclosure means, while a second enclosure means is constituted by the interiors of the supports 20 and sleeves 22. An important feature of the invention resides in the fact that the threaded connections of the pipes 11 and 12 to the end casings 10 and to the ceiling fixtures (not shown), the threaded connections of the conduits 18 to the casings 10 and housing 14, the threaded connections of the end supports 20 to the extensions 19, the threaded connections of the insulating plugs 37 to the same extensions and the threaded connections of the covers 39 and 40 all have a sufficient number of threads to prevent the passage of flame in either direction. A similar function is performed by the ground mating surfaces of the housing parts 15 and 16. Accordingly, the two general enclosure means, as defined above, are each flame sealed from the atmosphere and are also flame sealed from each other by the insulating plugs 37. Hence, any explosions that may occur within either enclosure means are respectively localized from each other and from the atmosphere.

Another important feature of the invention resides in the mounting of the lighting tube 24 within the sleeve 22 so that an annular air space exists therebetween. The column of air in this space provides a very effective medium for absorbing or cushioning any explosions that may take place in the end support 20 due to arcing of the starter. This cushioning action absorbs any strain that might otherwise be exerted by these explosions and hence protects the apparatus.

The reference in the claims to a "lighting fixture of the fluorescent type" or to a "fluorescent lighting fixture" generally includes fixtures in which illumination is achieved by an electrical discharge through gas or vapor-filled tubes.

I claim as my invention:

1. A fluorescent lighting fixture comprising in combination, end members each having first and second chambers, a seal between the chambers, a transformer housing disposed between the members and connected to the first chambers by conduits, the chambers, housing and conduits being sealed from the atmosphere, an open-end, tubular member impervious to moisture and air bridged between and having its ends sealed in walls of the second chambers, means for supporting a lighting tube in position to extend through the tubular member in spaced relation thereto, and electrical starting means for the tube in one of the second chambers having conductors extending through the seal between the adjacent chambers.

2. A fluorescent lighting fixture comprising in combination, end members each having first and second chambers, a seal between the chambers, a sealed transformer housing disposed between the members and comprising separable parts having ground abutting surfaces, conduits connecting the housing to the first chambers, the chambers and conduits being sealed from the atmosphere, an open-end, tubular member impervious to moisture and air bridged between and having its ends sealed in walls of the second chambers, means for supporting a lighting tube in position to extend through the tubular member in spaced relation thereto, and electrical starting means for the tube in one of the second chambers having conductors extending through the seal between the adjacent chambers.

3. In an explosionproof lighting fixture of the type described, the combination of a rigid-walled hollow end casing having a partition therein dividing its interior into first and second chambers, a light-pervious sleeve leading outward from said second chamber and rigidly sealed to said casing, means sealing the outer end of said sleeve, means for supporting a fluorescent lighting tube within said sleeve in position to present an end terminal adjacent the end of said sleeve which is sealed to said casing, said partition having an aperture therein extending between said chambers, an insulating plug screwed in said aperture and completely filling the same, a conductor embedded in said plug, an electrical supply connection in said first chamber connected to said conductor, and an electrical connection for said terminal of the lighting tube passing through said second chamber and also connected to said conductor.

4. In an explosionproof lighting fixture of the type described, the combination of a pair of spaced hollow end members, a light-pervious sleeve extending between said end members and fixedly sealed thereto with its opposite ends opening into the interiors of respective ones of said end members, means for supporting a fluorescent lighting tube within said sleeve in spaced relation to the latter, a reenforcing strut extending between said end members and fixed thereto, a transformer casing supported by said strut, a pair of rigid conductor conduits threaded at their opposite ends in said transformer casing and in respective ones of said end members, and a system of electrical supply conductors for the lighting tube for connection to its opposite ends and housed within said end members and the conduits and transformer casing.

5. An explosionproof fluorescent lighting fixture comprising, in combination, a pair of spaced and structurally separate hollow casing elements having massive explosion-resistant walls, said elements having aligned openings in their opposed portions, a rigid light-pervious sleeve extending between said elements in registry with said openings, means for supporting a fluorescent lighting tube in position to extend longitudinally through said sleeve with its end portions dis-

posed in said openings, each of said casing elements having a further opening therein in its top portion closed by means of including insulating plugs, a second pair of casing elements removably fixed to the tops of respective ones of the first-mentioned pair, reenforcing means joining said second pair of elements, and means including conductors embedded in said plugs for establishing electrical supply connections from points within said second pair of elements to end terminals of the lighting tube within the first-mentioned pair of elements.

6. An explosionproof fluorescent lighting fixture comprising, in combination, a pair of spaced and structurally separate hollow casing elements having massive explosion-resistant walls, said elements having aligned openings in their opposed portions, a rigid light-pervious sleeve extending between said elements in registry with said openings, means for supporting a fluorescent lighting tube in position to extend longitudinally through said sleeve with its end portions disposed in said openings, each of said casing elements having a further opening therein in its top portions closed by means including insulating plugs, a second pair of casing elements removably fixed to the tops of respective ones of the first-mentioned pair, reenforcing means joining said second pair of elements, means including conductors embedded in said plugs for establishing electrical supply connections from points within said second pair of elements to terminals of the lighting tube within the first-mentioned pair of elements, and each of the four casing elements constituting said two pairs of the same having an opening therein for access to its interior and closed by an individual threaded cover.

7. An explosionproof fluorescent lighting fixture comprising, in combination, a pair of spaced and structurally separate hollow casing elements having massive explosion-resistant walls, said elements having aligned openings in their opposed portions, a rigid light-pervious sleeve extending between said elements in registry with said openings, means for supporting a fluorescent lighting tube in position to extend longitudinally through said sleeve with its end portions disposed in said openings, each of said casing elements having a further opening therein in its top portion, a second pair of casing elements disposed atop respective ones of the first-mentioned pair and fixed thereto by projections on one of the superimposed elements threaded in an aperture in the other, said projections having insulating plugs extending therethrough, reenforcing means joining said second pair of elements, and means including conductors embedded in said plugs for establishing electrical supply connections from points within said second pair of elements to end terminals of the lighting tube within the first-mentioned pair of elements.

8. An explosionproof fluorescent lighting fixture comprising, in combination, a pair of spaced and structurally separate hollow casing elements having massive explosion-resistant walls, said elements having aligned openings in their opposed portions, a rigid light-pervious sleeve extending between said elements in registry with said openings, means for supporting a fluorescent lighting tube in position to extend longitudinally through said sleeve with its end portions disposed in said openings, a second pair of casing elements threadedly connected to the tops of respective ones of the first-mentioned pair, a reenforcing strut rigidly joining said second pair of elements, and a sheet metal hood of inverted trough shape extending between said second pair of elements and removably fixed thereto, said hood being disposed above said strut with its side walls extending down below the latter to hide the same.

NILS A. TORNBLOM.

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Aug. 17, 1948. **H. J. BAKER** 2,447,048

ARRESTER ELEMENT

Filed Jan. 15, 1944

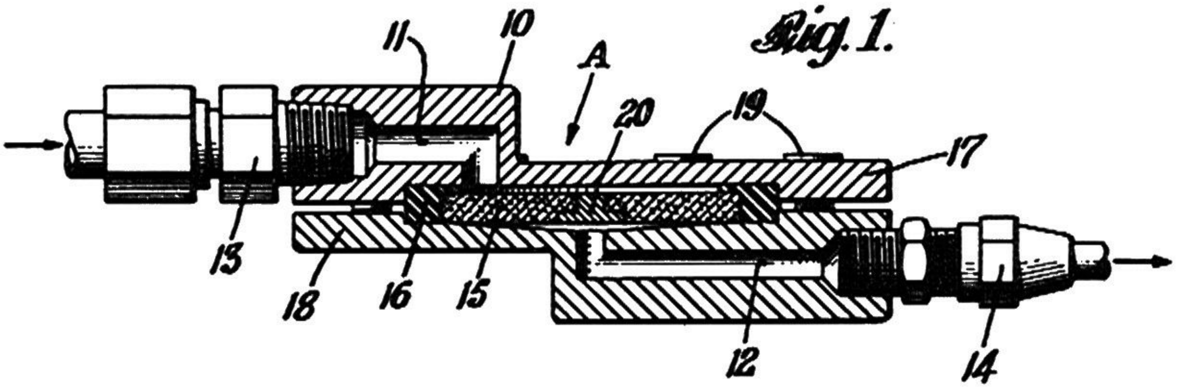


Fig. 1.

Fig. 2.

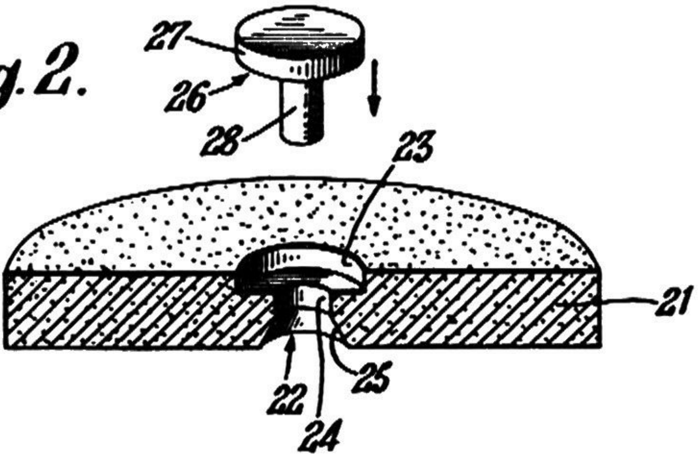
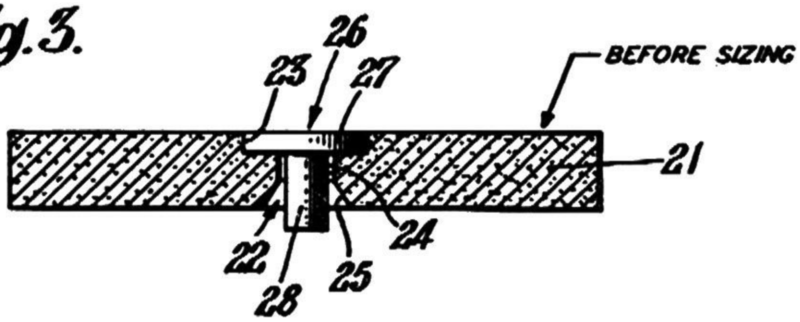


Fig. 3.



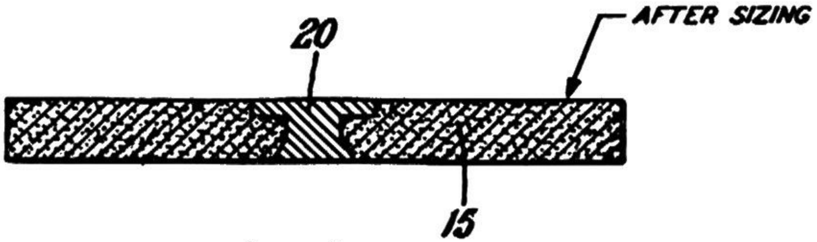


Fig. 4.

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Patented Aug. 17, 1948 2,447,048

UNITED STATES PATENT OFFICE

2,447,048

ARRESTER ELEMENT

Harry J. Baker, Speedway, Ind., assignor to Union Carbide and Carbon Corporation, a corporation of New York

Application January 15, 1944, Serial No. 518,350

2 Claims. (Cl. 48—192)

This invention relates to porous type backfire arresters for use in combustible gas systems such as blowpipes, and more particularly to a porous backfire arresting element having a flame deflector therein and to a method of fabricating the same.

It has been found that the porous metal element of such arresters fail over the face area thereof nearest to the discharge passage of the arrester casing. In order to prevent premature destruction of the porous element, it has been proposed to insert a nonporous metal plate or deflector in the porous material which will absorb the shock of a backfire and disperse the flame of a backfire prior to entry into the pores of the porous element. In the fabrication of the porous element itself, the porous material as supplied by the trade does not have a porosity suitable for use with blowpipes and has to be reworked or compressed to the proper porosity for extinguishing a backfire. Heretofore, the deflectors have been inserted in the porous element after the sizing operation and in such a manner that they are liable to become loose with use.

Objects of the present invention are to provide a porous element for porous type backfire arresters with a deflector which will not become loose with use; and to provide a simple method of securing a nonporous deflector in the porous body of the element and sizing the latter.

According to the present invention, an unsized deflector of solid metal is inserted in an unsized porous metal block. As the block is compressed to size, the deflector is simultaneously upset and caused to fit securely within the sized porous element. The deflector extends axially through the plate, and is reduced to the same length that the porous block is reduced in thickness, leaving its ends flush with opposite faces of the porous element. Advantage is thereby taken of the sizing step in manufacture of the porous element to secure the deflector firmly in place within the porous element.

For other objects and for a better understanding of the invention, reference may be had to the following detailed description taken in connection with the accompanying drawing, in which

Fig. 1 is a cross sectional view of a backfire arrester embodying the porous arresting element of the present invention,

Fig. 2 is an exploded isometric view of the unsized porous block and of the unsized deflector insert prior to the latter being fitted within its

opening in the porous block, with the block being shown in half section,

Fig. 3 illustrates the assembled porous block and insert before the sizing operation,

Fig. 4 is a cross sectional view of the completed porous element.

Referring now particularly to Fig. 1, there is shown a backfire arrester A comprising a casing 10 having a gas inlet passage 11 and a gas outlet passage 12. To the inlet 11 and outlet 12 there is respectively connected pipe couplings 13 and 14. During the operation of a blowpipe for example flashbacks and backfires of the gas strike at a downstream face of a porous element 15. The porous element 15 is retained in a ring 16 which is clamped between separable parts 17 and 18 of the casing 10. Such parts 17 and 18 are clamped together by bolts 19.

The normal direction of flow of the combustible gas through the flash arrester A is from the inlet 11 through pores of the porous element 15 and outwardly through outlet passage 12 and pipe coupling 14. But upon the occurrence of a backfire the flame moves in the reverse direction.

In order that the porous element be not destroyed over the area of the downstream face adjacent the gas outlet passage 12, it has been proposed to provide in that area a solid or nonporous metal deflector adapted to absorb the shock of a backfire to distribute the flame of a backfire over an enlarged area i. e. over the porous major portion of the disc face to insure its extinguishment.

Referring now to Figs. 2, 3 and 4, according to the invention, a porous arresting element with a deflector is produced by the following method. To start with there is provided an unsized porous metal block 21 of a porosity unsatisfactory for use in a blowpipe and which needs to be compressed to size. Such porous block may be made by sintering together bronze metal particles, such material being known to the trade as Porex.

Into the block 21, there is drilled or otherwise formed during manufacture of the block a central hole or opening 22 consisting of an enlarged portion 23, a narrow portion 24 and a frustoconical portion 25. This opening is such as to receive an unsized deflector insert 26 of solid metal fashioned with an enlarged head 27 and a shank 28. This insert is of such size as to fit loosely within the opening 22 with the enlarged head 27 located in the portion 23 and the shank 28 in the portions 24 and 25. When the parts have been so assembled, the final sizing operation is performed by compressing the porous metal block 21 in a direction to reduce its thickness and at the same time to upset the solid metal insert 26 so that the enlarged head and shank thereof fill all portions of the opening, the end faces of the insert being brought flush with the faces of the disc to provide a deflector 20. The porous element 15 is thus made satisfactory for use in a blowpipe flash arrester and the deflector 20 is made thoroughly secure in direct heat-conductive relation with the porous material. Accordingly, the invention provides a simple method of providing a porous flash arresting element with a flame deflector. From Figs. 3 and 4 of the drawing it may be seen that upon sizing or compressing the arrester and deflector, that the shank 28 is upset and the porous arrester is compressed tightly around the shank. Since bronze is known to contain a substantial quantity of copper it will be apparent that sintered bronze is heat conductive. The sizing pressure causes the pores to be slightly flattened or deformed compared to the shape of the pores in an unsized disc. The shank 28 of the deflector is compacted more than the metal in the head 27 because the shank is subjected to greater compression per unit of cross sectional area in shortening. A large area of the head 27 is placed under no greater compressive stress than the porous disc. To the extent that the porous material between the engaged ends of the shank may be retained under compression the shank of the deflector is under tension.

This application is an improvement upon the arrester described and claimed in the prior application of Messrs. Olsen and Berger, Serial No. 518,422, filed January 15, 1944.

While detail changes may be made in the construction of and the method of fabricating these porous disc elements, it shall be understood that such changes shall be within the spirit and scope of the present invention as defined by the appended claims.

I claim:

1. A backfire arresting and filter element comprising a disc of porous heat conductive sintered metal having tortuous interconnected pores of a small size capable of extinguishing a backfire flame, a non-porous metallic button-like member embedded in and supported by the porous sintered disc with the exposed face of the button-like member extending over a substantial part of only the central portion of a downstream face of said disc near and not sunk below the adjacent face of said porous disc to receive the impact of and spread any backfire flame arrested in the pores of said sintered metal disc, a shank portion for the button-like member connected thereto for holding the same in place on the disc face, said shank portion extending well into the body of said disc and provided with an anchorage portion of shape in the plane of the disc which is enlarged with respect to that of the shank portion and adapted for cooperation with the porous metal to retain the button-like member and shank portion from coming out of the porous disc.

2. An arresting element of the porous type comprising a disc of porous sintered metal, a non-porous metallic button-like member embedded in the porous sintered metal disc having the exposed face of the head portion thereof substantially flush with one of said disc faces, said face extending over a substantial part of the central portion of said disc, a shank member integrally joined to the button-like member extending through said disc to the other face thereof and having its exposed end substantially flush with said other face, the portion of the shank member adjacent said other face being flared.

HARRY J. BAKER.

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July 19, 1949. C. H. BISSELL ET AL **2,476,352**

LIGHTING FIXTURE

Filed April 24, 1946 4 Sheets-Sheet 1

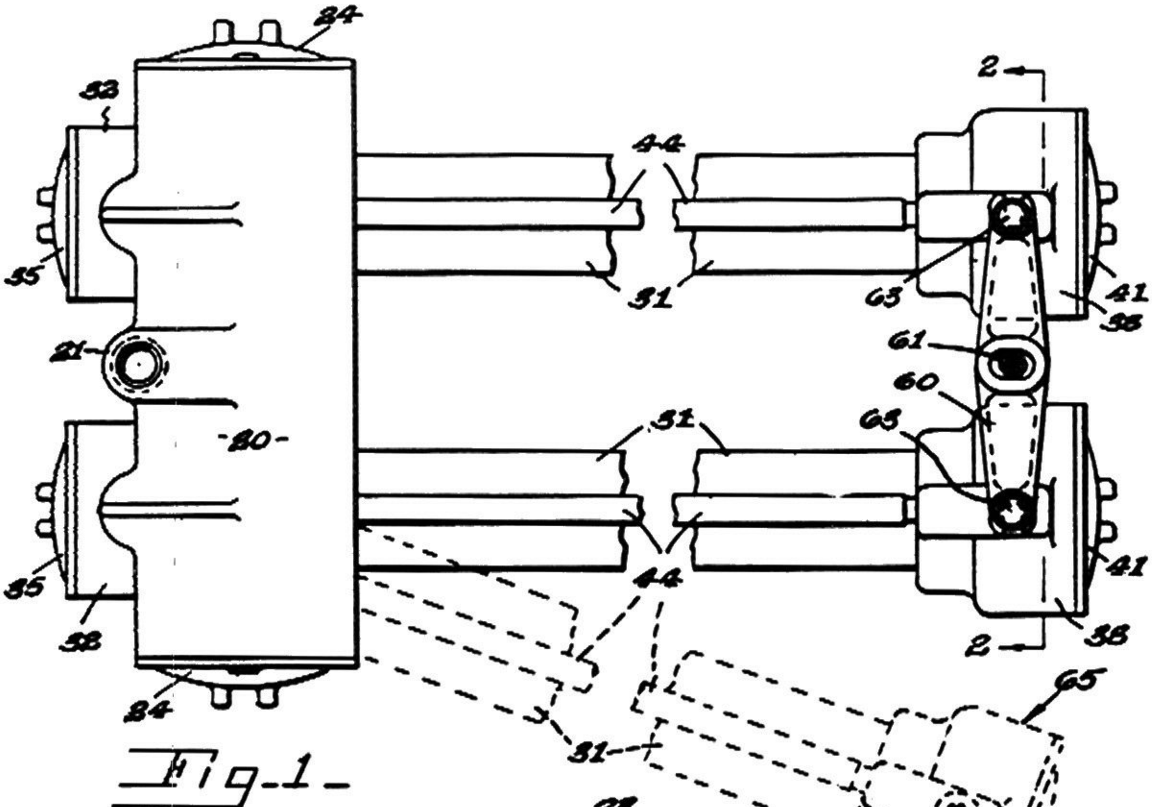

Fig. 1

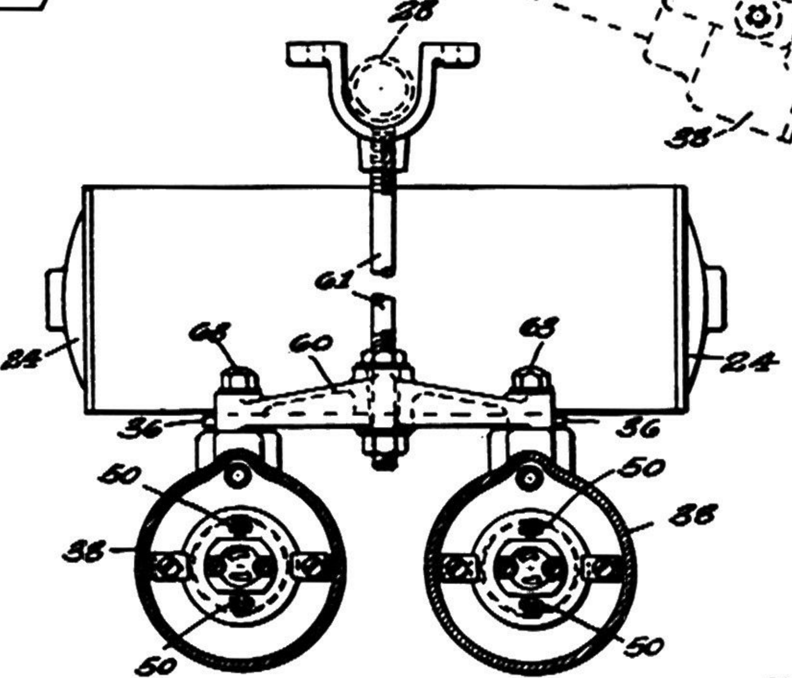

Fig. 2

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LIGHTING FIXTURE

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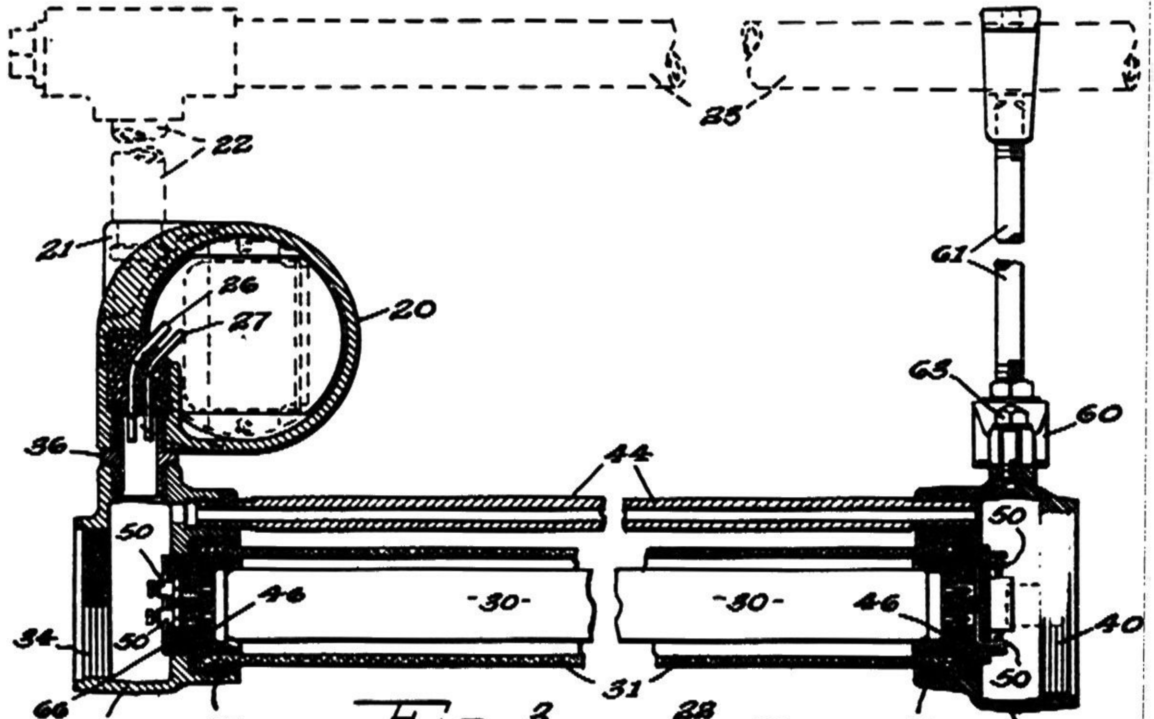

Fig. 3

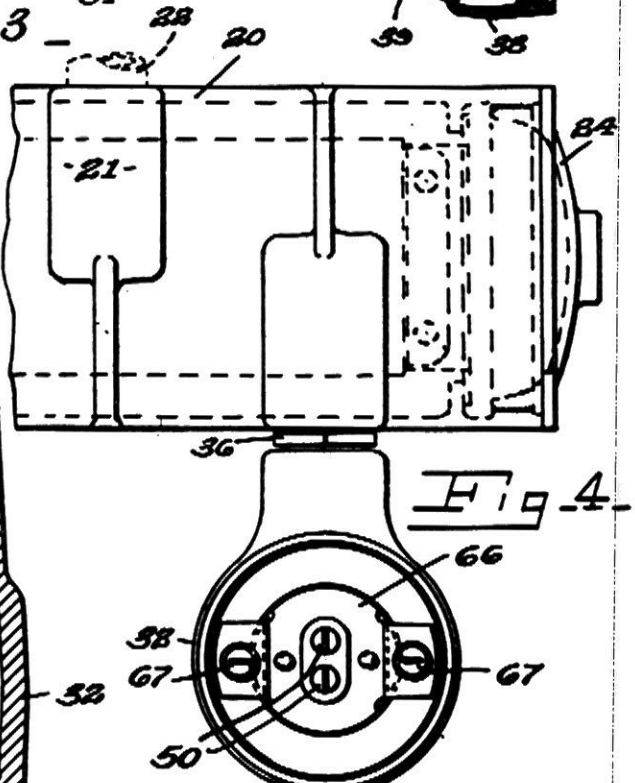

Fig. 4

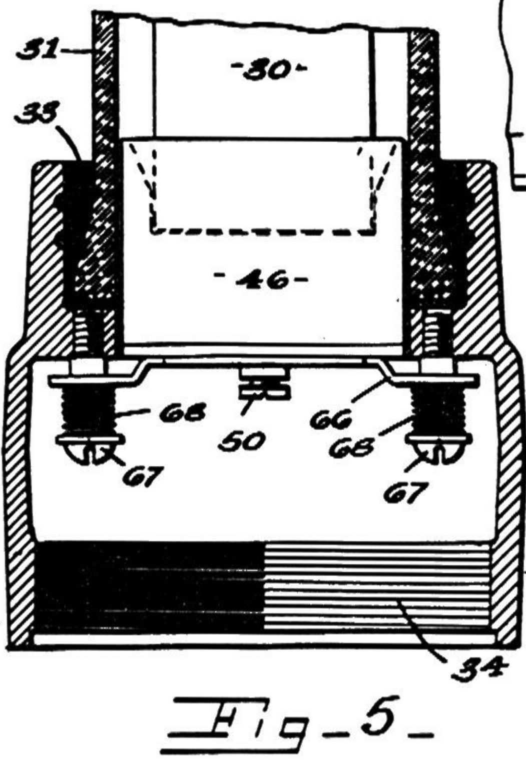

Fig. 5

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LIGHTING FIXTURE

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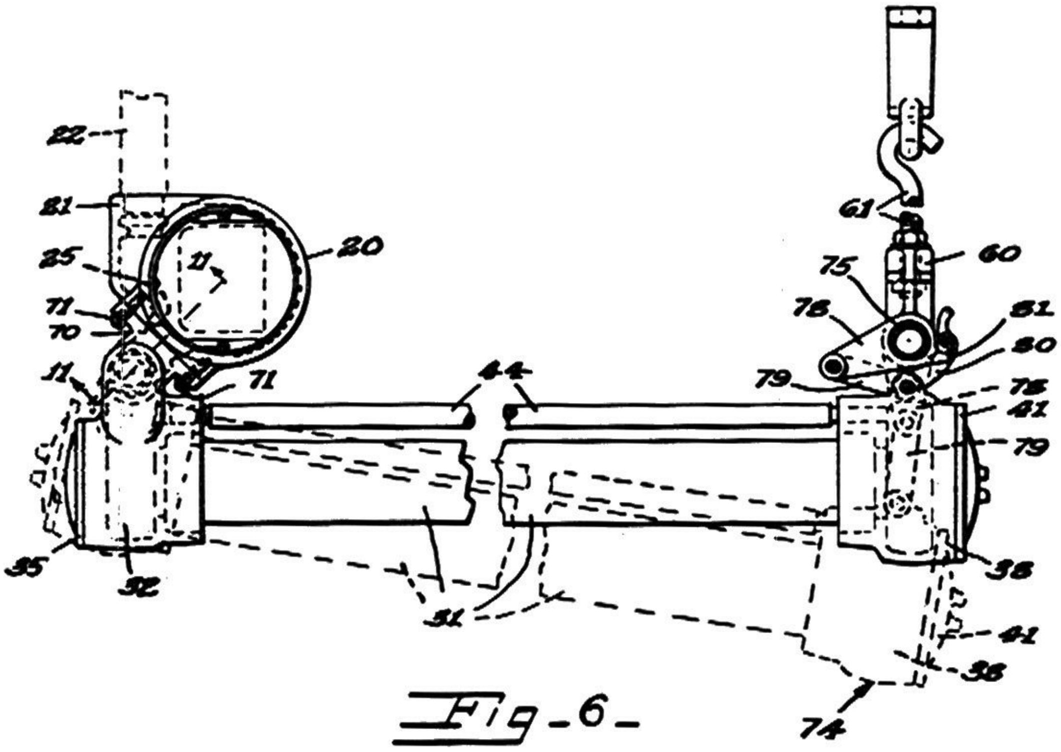

Fig. 6.

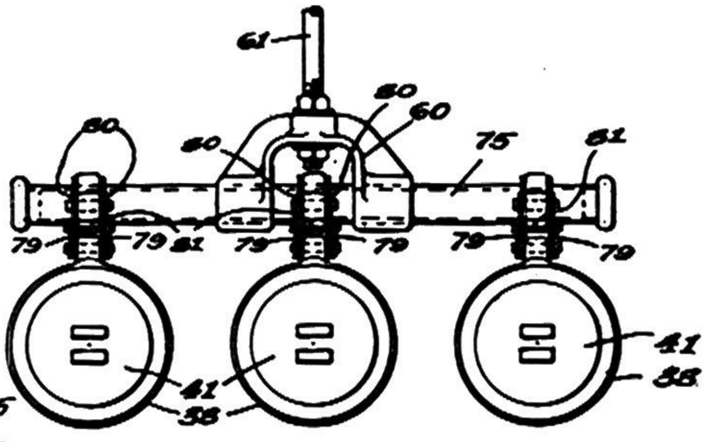

Fig. 7.

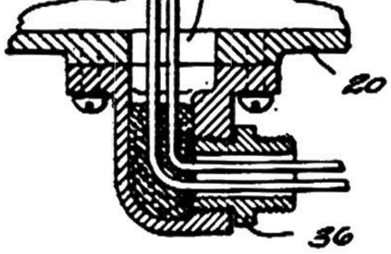

Fig. 11.

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July 19, 1949. **C. H. BISSELL ET AL** 2,476,352

LIGHTING FIXTURE

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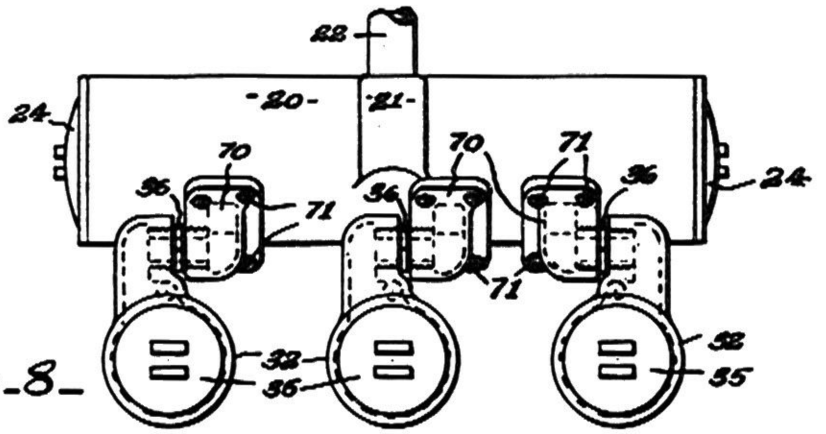

Fig-8

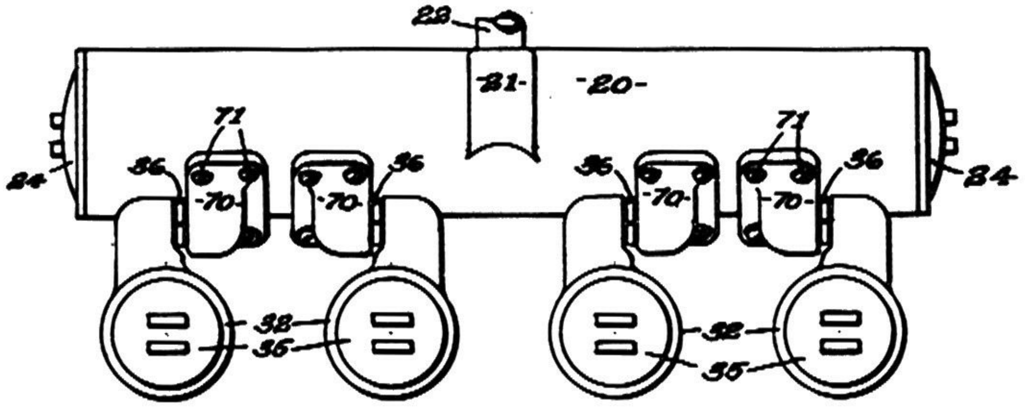

Fig-9

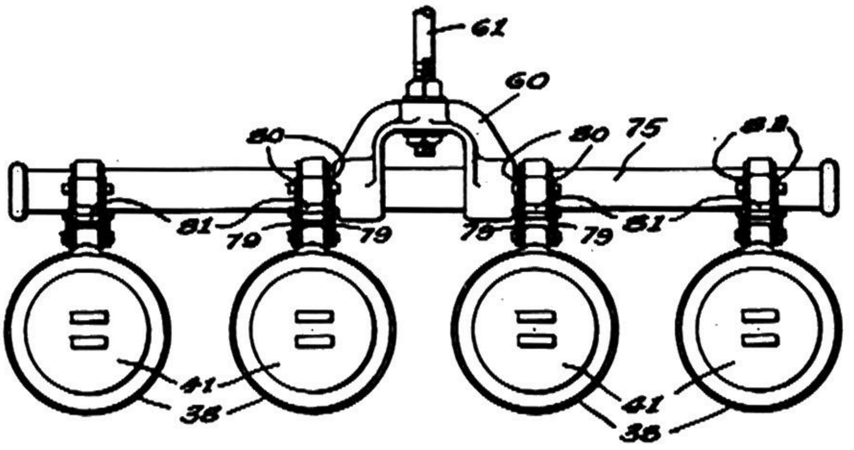

Fig-10

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Patented July 19, 1949 **2,476,352**

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UNITED STATES PATENT OFFICE

2,476,352

LIGHTING FIXTURE

Carl H. Bissell and Ray F. Lester, Syracuse, N. Y.,
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N. Y., a corporation of New York

Application April 24, 1946, Serial No. 664,472

7 Claims. (Cl. 240—11.2)

This invention relates to an explosion resisting lighting fixture of the type employing a fluorescent tube as a light source.

The invention has as an object a lighting fixture of the type referred to suitable for installation in hazardous locations, and which involves a structure that is particularly economical to manufacture, and convenient to install.

The invention has as a further object a structure which permits the use of a plurality of fluorescent tubes in the fixture, and by which the individual fluorescent tube enclosing units may be moved out of normal parallel relationship to permit the units to be relamped and, at the same time, to permit the lighting fixtures to be mounted end to end in close relationship.

The invention consists in the novel features and in the combinations and constructions hereinafter set forth and claimed.

In describing this invention, reference is had to the accompanying drawings in which like characters designate corresponding parts in all the views.

Figure 1 is a top plan view of a lighting fixture embodying our invention.

Figure 2 is an end elevational view, looking to the left Figure 1, with parts shown in section, the section being taken on line 2—2, Figure 1.

Figure 3 is a lengthwise sectional view taken substantially on the center of one of the fluorescent tube enclosing units.

Figure 4 is an end elevational view of a portion of the structure shown in Figure 1, looking to the right.

Figure 5 is a sectional view of one of the transparent tube end members and contiguous portion of the tube.

Figure 6 is a side elevational view of a modified structure.

Figure 7 is an end elevational view looking to the left, Figure 6.

Figure 8 is an end elevational view looking to the right, Figure 6.

Figure 9 is a view, similar to Figure 8, illustrating the arrangement when four fluorescent tubes are employed.

Figure 10 is an end elevational view looking to the left, Figure 6, the fixture including four fluorescent tubes.

Figure 11 is a fragmentary sectional view taken substantially on line 11—11, Figure 6.

The device consists of a housing 20 which is shown as of general cylindrical formation, and provided with means for attachment to a conduit line, as an internally threaded boss 21, to receive the conduit 22 which depends from the conduit

line 23. The function of the housing 20 is to house the transformer or ballast equipment used in connection with the operation of fluorescent lighting tubes, the housing being provided with openings in the ends thereof which are closed by plugs 24 threaded into the ends of the housing. The housing is also provided with an aperture 25 in one side wall, through which conductors 26, 27, extend.

The fluorescent tube 30 is arranged in a tubular member 31 formed of glass, or other light transmitting material. A hollow end member 32 is sealed to one end of the tubular member 31, as at 33. The outer wall of the end member is formed with an access opening arranged in register with the tube 30 and threaded internally, as at 34, to receive a closure 35. The end member 32 is pivotally secured to the housing 20 as by a connecting member 36 shown in the form of an externally threaded nipple, one end of which threads into the top wall of the end member 32, and the opposite end threading into the side wall of the housing 20, whereby the end member 32 is secured to the housing 20 in flametight relation thereto, and the end member, together with the tubular member extending outwardly therefrom, may be rotated about the axis of the connecting member 36.

An end member 38 is sealed to the opposite end of the tubular member 31, as at 39, and is also provided with an access opening in the outer wall in register with the fluorescent tube 30 and threaded internally, as at 40, to receive a plug or closure 41.

A conduit 44 extends between the end members 32, 38, and communicates with the interiors thereof. The connecting member 36 and the aperture 25 form a passage through which the conductors 26, 27, extend from the interior of the ballast housing 20 to the interior of the end member 32.

A terminal block 46 is mounted in each of the end members 32, 38, and provided with contacts 50 engaging the contacts on the ends of the fluorescent tube 30. The purpose of the conduit 44 is to enclose the branch conductors extending to the contacts in the end member 38 to the interior of end member 32. It may, at one end, be threaded into one of the end members, such as the end member 32, or both ends of the conduit may slidably engage apertures formed in the end members, as illustrated in connection with end member 38.

It will be understood that the length of the fluorescent tube 30 will vary in accordance with the wattage of the fixture and accordingly, the length of the transparent tubular member 31 and the conduct 44 is determined by the length of the fluorescent tube 30 used in the fixture. When longer tubes are used, it is desirable to provide means for supporting the outer end member 38. To provide such support, a bracket 60 is carried by a rod 61 depending from the conduit line 23, or ceiling of the room, and extends transversely above the end members 38.

As illustrated in Figures 1 to 3, the fixture is designed to employ two fluorescent tubes and there are accordingly two tubular members 31 and likewise, two pairs of end members 32 and 38. With this arrangement, the outer ends of the bracket 60 are bifurcated to receive screws 63 threading into the top wall of the end members 38 and by which the end members are detachably secured to the bracket.

In order to obtain proper lighting effects, it is desirable to mount fluorescent tube fixtures end to end and in close proximity. With the structure described, each fluorescent tube enclosing unit, including the light transmitting tubular members 31 and the end members carried thereby, may be swung about the vertical axis of the connecting members 36 to the dotted line position shown at 65, Figure 1. The closure 41 may be then removed together with the terminal block 46 and the fluorescent tube 30 withdrawn and a new one inserted, the terminal block and the closure 41 replaced, the unit swung back into parallel relationship and secured by the screw 63. The terminal blocks 46 may be mounted upon a cross member 66, the ends of which are apertured to receive screws 67 threading into the adjacent wall of the end member 32—38, the terminal blocks being yieldingly urged into engagement with the end of the fluorescent tube 30 by compression springs 68 acting between the heads of the screws 67 and the mounting member 66.

In Figures 8 to 11, the housing 20 and the supporting bracket are modified slightly so that more than two fluorescent tubes may be employed in the fixture. The end members 32 are pivotally connected to hub members 70 detachably secured to the side wall of the housing 20, as by screws 71. The hubs 70 are hollow, or formed with an aperture extending therethrough, the outer end of which is internally threaded to receive the connecting member 36 with its axis extending parallel to the axis of the housing 20. That is, in horizontal position. This arrangement permits the outer end of the fluorescent tube units to be moved vertically out of parallel and horizontal relationship, as indicated by the dotted outline 74, Figure 6, and with this arrangement three, four, or more, fluorescent tube units may be incorporated in the fixture.

The supporting bracket 60, shown in connection with this arrangement, includes a transversely extending tube 75 on which arms 78 are journalled, one of such arms being provided for each fluorescent tube unit. A pair of links 79 are pivotally connected at one end to the arm 78, and at its opposite end to the end member 38. A second pair of links 80 are also pivotally connected at one end to the end member 38, and is provided at its opposite end with means to engage an outwardly extending boss 81 formed on the arm 78. This pair of links 80, when the upper end thereof is engaged upon the boss 81, serves to maintain the toggle formed by the arm 78 and links 79 closed, and to maintain the end member 38 in proximity to the tube 75 or, in other words, to maintain the fluorescent tube unit in horizontal position.

When it is desired to relamp the unit, the free end of the link 80 is disengaged from the projection 81, whereupon the toggle is permitted to straighten out and the end member 38 to move downwardly away from the bracket to the dotted outline position 74, Figure 6, whereupon the fluorescent tube may be removed and a new one inserted, as previously explained.

What we claim is:

1. An explosion resisting fluorescent lighting fixture comprising a housing formed with an aperture in one wall thereof and provided with means for connection to a conduit line, a hollow hub member detachably secured to the housing in flame tight relation thereto and in register with the aperture in the side wall thereof, a tubular member formed of light transmitting material, a hollow end member sealed to each end of said tubular member, and each of said end members being formed with an access opening in register with said tubular member, a terminal block mounted in each of said end members and having contacts engageable with the contacts on the ends of a fluorescent tube mounted in said member, a conduit extending between said end members and communicating with the interiors thereof, a closure for the access opening of each end member and being detachably secured thereto in flametight relation therewith, a connecting member pivotally connecting one of said end members to said hub member on a horizontal axis, said connecting member being formed with an aperture extending axially therethrough and which, in conjunction with said hub member and the aperture in the side wall of the housing, forms a passage for conductors leading from the interior of the housing to the interior of said end member.

2. An explosion resisting fluorescent lighting fixture comprising a housing formed with an aperture in one wall thereof and provided with means for connection to a conduit line, a hollow hub member detachably secured to the housing in flametight relation thereto and in register with the aperture in the side wall thereof, a tubular member formed of light transmitting material, a hollow end member sealed to each end of said tubular member, and each of said end members being formed with an access opening in register with said tubular member, a terminal block mounted in each of said end members and having contacts engageable with the contacts on the ends of a fluorescent tube mounted in said member, a conduit extending between said end members and communicating with the interiors thereof, a closure for the access opening of each end member and being detachably secured thereto in flametight relation therewith, a connecting member pivotally connecting one of said end members to said hub member on a horizontal axis, said connecting member being formed with an aperture extending axially therethrough and which, in conjunction with said hub member and the aperture in the side wall of the housing, forms a passage for conductors leading from the interior of the housing to the interior of said end member, and a sealing medium arranged in said hub member about said conductors and effective to seal off the interior of the housing from the interior of said end member.

3. An explosion resisting fluorescent lighting fixture comprising a housing provided with means for connection to a conduit line, a plurality of end members pivotally connected to said housing in flametight relation thereto, a transparent tubu-

lar member sealed at one end to each of said end members, and a hollow end member secured to the opposite free end of each of said tubular members, said end members being formed with access openings in register with said tubular members, a terminal block mounted in each of said end members and arranged to support a fluorescent lighting tube in each of said tubular members, a conduit connecting the pair of end members carried by each tubular member and communicating with the interiors thereof, a bracket adapted to support the end members secured to the free ends of said tubular members with said tubular members extending in parallel relationship, and means for detachably connecting said end members to said bracket, whereby said tubular members may be moved about their respective pivots out of said parallel relation.

4. An explosion resisting fluorescent lighting fixture comprising a housing provided with means for connection to a conduit line, a plurality of end members pivotally connected to said housing on a horizontal axis in flametight relation thereto, a transparent tubular member sealed at one end to each of said end members, and a hollow end member secured to the opposite free end of each of said tubular members, said end members being formed with access openings in register with said tubular members, a terminal block mounted in each of said end members and arranged to support a fluorescent lighting tube in each of said tubular members, a conduit connecting the pair of end members carried by each tubular member and communicating with the interiors thereof, a bracket adapted to support the end members secured to the free ends of said tubular members with said tubular members extending in parallel relationship, fastening means cooperable with each of said end members and said bracket to maintain said tubular members in horizontal parallel relationship, and being operable to permit said end members to move downwardly from said bracket, whereby said tubular members may be moved about their respective pivots out of said parallel relation.

5. An explosion resisting fluorescent lighting fixture comprising a housing provided with means for connection to a conduit line, a plurality of end members pivotally connected to said housing on a horizontal axis in flametight relation thereto, a transparent tubular member sealed at one end to each of said end members, and a hollow end member secured to the opposite free end of each of said tubular members, said end members being formed with access openings in register with said tubular members, a terminal block mounted in each of said end members and arranged to suuport a fluorescent lighting tube in each of said tubular members, a conduit connecting the pair of end members carried by each tubular member and communicating with the interiors thereof, a bracket adapted to support the end members secured to the free ends of said tubular members with said tubular members extending in parallel relationship, fastening means cooperable in one position with each of said end members and said bracket to maintain said tubular members in horizontal parallel relationship, and being operable to permit said end members to move downwardly from said bracket and to support said end members in such downward position.

6. An explosion resisting fluorescent lighting fixture comprising a housing formed with an aperture in one wall thereof and provided with means for connection to a conduit line, a tubular member formed of light transmitting material, a hollow end member sealed in flametight relation to each end of said tubular member, one of said hollow members being formed with an access opening in register with said tubular member, a closure detachably secured to said opening in flametight relation thereto, a terminal block mounted in each of said end members and having contacts engageable with the contacts on the ends of a fluorescent tube mounted in said tubular member, a conduit extending between said end members and communicating with the interiors thereof, the ends of said conduit engaging said members in flametight relation thereto, and a portion of said conduit having free axial movement relative to one of said end members, means pivotally connecting one of said end members in flametight relation to said housing, said means being formed with a passageway arranged in register with the aperture in the side wall of the housing and forming a passage for conductors leading from the interior of said housing to the interior of said end member, a bracket detachably secured to said other end member whereby said tubular member may be moved about the axis of said pivotal connecting means.

7. An explosion resisting fluorescent lighting fixture comprising a housing formed with an aperture in one wall thereof and provided with means for connection to a conduit line, a tubular member formed of light transmitting material, a hollow end member sealed in flametight relation to each end of said tubular member, one of said hollow members being formed with an access opening in register with said tubular member, a closure detachably secured to said opening in flametight relation thereto, a terminal block mounted in each of said end members and having contacts engageable with the contacts on the ends of a fluorescent tube mounted in said tubular member, a conduit extending between said end members and communicating with the interiors thereof, the ends of said conduit engaging said members in flametight relation thereto, and a portion of said conduit having free axial movement relative to one of said end members, means pivotally connecting one of said end members in flametight relation to said housing, said connecting means being arranged in register with the aperture in the wall of said housing and forming an enclosed passageway for conductors leading from the interior of the housing to the interior of said end member, means positioned in said passageway and effective to seal off the interior of the housing from the interior of said end member, a bracket detachably secured to said other end member whereby said tubular member may be moved about the axis of said pivotal connecting means.

CARL H. BISSELL.
RAY F. LESTER.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
716,595	Taussig	Dec. 23, 1902
2,318,536	Stern	May 4, 1943
2,392,202	Tornblom	Jan. 1, 1946

FOREIGN PATENTS

Number	Country	Date
480,774	Germany	Aug. 9, 1929

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Paper No. 20

DEPARTMENT OF COMMERCE
UNITED STATES PATENT OFFICE
WASHINGTON

Appeal No. 37,592

Before the Board of Appeals

In re application of Nils A. Tornblom, Ser. No. 789,444, Filed December 3, 1947, For Explosionproof Light Fixture.

Messrs. Carlson, Pitzner, Hubbard & Wolfe for Appellant

Examiner's Answer

This is an appeal from the final rejection of claims 14, 15, 16, 18 through 23 and 25. No claim is allowed.

A correct copy of the appealed claims appears on pages 2, 3 and 4 of the applicant's brief.

The references of record relied on are correctly listed on page 5 of the applicant's brief.

The Device

The disclosure relates to an explosionproof fluorescent lighting fixture adapted for mounting in a recessed position in the wall of a room.

As illustrated in Fig. 2 the fixture comprises a pair of opposed end casings 14 and 15 maintained in spaced relation by the hollow strut 16 threaded in the external bosses 48 and 55 on the casings. The casings 14 and 15 are further provided with opposed bores 31 surrounded by internal shoulders 32 in which the ends of the heavy glass protective tubes 18 are seated and sealed. Tubular fluorescent lamps 12 are arranged in the tubes 18 together with the necessary sockets 36 and starter switches S. The internal shoulders or bosses 32 in the casing 14 serve to partially divide the interior of the casing into a pair of lamp compartments 41 and a central compartment 42 in which the rotary control switch 44 is positioned.

The lower casing 15 is similarly constructed with lamp compartments 51, a central compartment 50 for the terminal block 49, and a third compartment 52 to receive the usual ballast for the lamps. The compartment 52 is cast integral with and on the front of the casing 15.

In order to permit installation of the lamps 12, socket 36, starter switches S and the necessary wiring, and also to render such parts accessible for servicing, each end casing 14 and 15 is provided with handhole openings which are closed by means to screw-threaded plugs 38 and 70 respectively. A similar handhole plug 58 is provided in the lower casing 15 opposite the terminal block as shown in Fig. 4. Each of the plugs 38, 58 and 70 comprises a rigid porous metallic disk 79 forming a unitary structure with the threaded ring of the plug. The purpose of the porous disks is to dissipate any gas pressure which might occur in any of the internal chambers of the fixture as the result of an explosion of explosive gases without permitting the leakage of flame to the exterior atmosphere.

The circuit as illustrated in Fig. 8 is of the conventional type used for fluorescent lamps. The seals 74 and 78 are provided in the wire passages to further separate the various compartments of the fixture.

In use the fixture described is mounted in a cabinet 11 which is recessed in a wall 24 of a room. As illustrated in Fig. 3 the mounting means comprises a swivel fitting 80 to which the lower casing 15 is attached and a spring clip 81 which engages the strut 16. The interior of the cabinet is finished with a light colored reflecting surface and the front frame 25 is provided with a transluscent or transparent panel 29. In the event that the lamp needs servicing the front cover 25, 29 of the cabinet is removed whereupon the fixture may be hinged out of the cabinet on the swivel fitting as shown in dot-and-dash lines in Fig. 3. The handhole plugs 38 and 58 may then be removed to permit removal and replacement of the lamps 12 or to permit access to the terminal block 49.

The References

Tornblom (applicant's prior patent) discloses an explosionproof fluorescent lighting fixture comprising a pair of spaced apart end casings 10, 20 connected by a pair of glass protective tubes 22 for the lamps 24 and a hollow strut 18. The ballast chamber 14 forms a part of the strut 18. Handhole plugs 40 and 39 provide access to the lamp chambers and the terminal block 32. The sealing plug 37 in the passageway between the casing sections 10 and 20 serves to separate the compartments of the fixture.

Bissell et al disclose an explosionproof fluorescent lighting fixture having end casings 32 and 38 supported in spaced apart relation by the glass protective tubes 31 and struts 44. The ballast chamber 20 is mounted directly on the end casing 32 by the swivel joint 36. As illustrated in Figs. 3 and 11 a sealing plug is used around the wires 26 and 27 between the ballast and the lamp chambers. Handhole plugs 24, 35 and 41 provide access to the ballast and lamp chambers. As illustrated in dotted lines in Figs. 1 and 6 the Bissell et al fixture may be hinged about the swivel 36 to a servicing position.

Sutter discloses the ballast 41 for the fluorescent lamp mounted directly in the end casing 10.

Keil discloses an explosionproof lamp fixture comprising an incandescent lamp b mounted within a wire gauze cylinder g which is closed at one end by the gauze disk g′ and the base piece h and at the other end by the gas tight connections d′, m, i to lamp socket a. Keil points out in lines 33-43 page 2 that "In case the lantern body should be crushed by any severe accident happening therto by which the bulb would be cracked or broken, and cause the ignition of any gases which might be within the lantern body by the spark of the incandescent light all liability of ignition of surrounding gases so as to cause an explosion, would be prevented by the gauze body of the lantern, so that the liability of the ignition of the gases is precluded under any circumstances".

Williams discloses a miner's safety lamp of the Davy type. The burner a is enclosed in the gauze cylinder c which is closed at its upper end. Explosive gases which are ignited within the cylinder are cooled, as they expand through the wire gauze, to a point below the ignition point of the explosive gases contained in the exterior atmosphere. The top C^3 of the Williams lamp is provided with an opening covered by a wire gauze disk G held in place by the threaded ring c^5. The disk G functions to prevent explosions in the event that the top of the gauze cylinder C burns out or is otherwise damaged.

Gover discloses a safety fuse for an electrical circuit. The terminals T, T′, mounted on the base B, have the fuse wire F connected therebetween. The casing C which encloses the fuse element has its open outer end covered by the wire gauze W. The patentee points out in lines 18-21 of his specification that "The casing C has a large opening at the top covered with wire gauze W such as is employed in a miner's safety lamp, or other pervious material such as will give free outlet for gases under pressure but will prevent communication of flame to the exterior."

Baker discloses a backfire arrester for use in combustible gas systems such as blowpipes. The arrester comprises a porous metal block 15 mounted in the fitting A coupled in the gas line. Gas normally flows from inlet 13, 11 through the porous element to the outlet passage 12, 14. In the event of a backfire the flame moves in the reverse direction and is prevented by the porous metal block 15 from moving on to the inlet passage 11. The porous metal block is "made by sintering together bronze metal particles".

Lee discloses a lamp 2 and its ballast in a wall mounting. The cabinet 1 has an inner reflector 17 and a lower chamber 3 for the ballast. The front of the cabinet is closed in flame-tight and gas-tight relation by the cover elements 7, 8, 9. The element 4 at the bottom of the cabinet houses the power supply leads and the clip 14 at the top of the casing releasably retains the lamp 2 in position.

The Rejection

Claims 14 and 15 stand rejected as not patentable over Tornblom (applicant's prior patent) in view of either Bissell et al or Suter. As applied to the claims Tornblom discloses an explosion proof fiuorescent lighting fixture comprising, in combination, first and second spaced apart end casings 10, 20 connected by a pair of glass protective tubes 22, one of the casings being partitioned, as shown in Fig. 2, to define a terminal chamber (terminals 32) and a lamp chamber 20, the partition also defining a sealing well for the gas seal plug 37 to isolate the terminal chamber from the potentially arcing portions of the fixture in the lamp chamber. The end casings are formed with hollow external bosses which are connected by the hollow supporting strut 18. The Tornblom ballast chamber 14 is arranged in the hollow strut rather than being formed as a part of one of the end casings. The patent to Bissell et al discloses the ballast chamber 20 directly attached to one of the end casings 32 of the fixture. The patent to Suter discloses the ballast 41 positioned in the end casing. It was held that in view of either Bisssell et al or Sutter no invention would be involved in forming the ballast chamber 14 disclosed in Tornblom integral with the end casing 10. It was further held that the use of gas sealing plugs, such as disclosed at 37 by Tornblom, where considered necessary involves nothing more than choice and judgment.

Claim 15 stands further rejected as fully met in Tornblom (applicant's prior patent). As applied to the claim the prior patent discloses an explosionproof lighting fixture, the combination of a first unitary end casting 10, 20 having laterally spaced apertures 21 therein, internal bosses defining sockets around said apertures, said bosses also defining a central terminal chamber and a pair of lamp chambers flanking the same and connected thereto by wireways, a second unitary end casting 10, 20 having lateraly spaced apertures therein with internal bosses defining sockets around said apertures, a pair of protective lamp enclosing tubes 22 connecting corresponding sockets of said castings and fixed to the same by means of gas tight joints 23, a pair of external central bosses on said end castings and having wireways, a hollow supporting strut 18 interposed between the external bosses and connected in gas tight relation therewith, gas seal plugs 37 in the wireways, and electrical wiring 33, 31, 35, 38 in said wireways communicating between electrical components of said end casting via said seal plugs. Claim 15 thus reads on the prior patent equally as well as upon the present disclosure.

In the discussion of claims 14 and 15 beginning with the last line page 15 of the brief it is stated that "It is significant to note that appellant's prior patent makes no provision whatever for the venting of internal pressure". It is pointed out, however, that neither claim 14 or 15 require any "venting of internal pressure". In response to the specific question appearing in lines 17-20 page 16 of the brief, it is pointed out that in the prior patent the internal bosses 26 in which the ends of tubes 22 are seated "define in said casing a central terminal chamber and a pair of lamp chambers flanking the same" in identically the same manner as the bosses for the ends of tubes 18 define chambers in the instant application.

Claims 16, 18 and 19 stand rejected as not patentable over Keil. Keil discloses in an electric lighting fixture the combination of an explosionproof fixture casing enclosed partially by a solid impervious wall such as h or d′, m, and partialy enclosed by a pervious wall of porous metal such as the gauze g which is integral with the detachable portion d′ of the impervious wall. It was held that the gauze wall g is the full equivalent of a "porous" metallic wall or "sintered metallic panel" as recited in the claims and for the identical purpose.

Claims 16, 18 and 19 stand further rejected as not patentable over Williams, Gover or Baker. Each of these patents discloses a fixture casing enclosed partially by a solid wall having a detachable portion and partially by porous material. It was held that the flame arresting element G of Williams, W of Gover, or 15 of Baker could be used in an electric lighting fixture if desired merely as a matter of choice and judgment without involving invention. It was further pointed out that these claims are unduly broad.

Applicant contends that he is entitled to the broad claims because the action which takes place in the devices of the references "is not an internal, high pressure explosion, but is rather a retarded burning of gas". That there is "a marked difference in principle and operation between an explosionproof lighting fixture such as appellant's and a Davy type safety lamp". It is the Examiner's position that there is no difference in principle and that patentability cannot be predicated upon relative differences in explosive forces which may occur in a fixture.

Claims 20, 21, 22 and 23 stand rejected as not patentable over either Tornblom (applicant's prior patent) or Bissell et al in view of either Williams or Baker. It was pointed out that these claims read directly on either Tornblom or Bissell et al except for the single detail of having porous metallic panels or plates in the plugs for the access openings 39, 40 of Tornblom and 24, 35, 41 of Bissell et al, to perform the function stated in the latter part of each claim namely, to permit flameless or explosionproof venting of the fixture. It was further pointed out that the function is well understood and elements for accomplishing it are well known as shown at G by Williams or at 15 by Baker. It was held that no invention would be involved in merely substituting the porous metallic flame arresting panel G of Williams or 15 of Baker for the access plugs 39, 40 of Tornblom or for the access plugs 24, 35, 41 of Bissell et al. It was further pointed out that to merely make the access plugs of Tornblom or Bissell et al of a porous material, such as disclosed by Baker, would at best, involve nothing more than a mere substitution of one well known material for another.

Claim 25 stands rejected as not patentable over Bissell et al in view of Lee or vice versa. As applied to the claim Bissell et al disclose a fixture having spaced apart end casings 32, 38, with access openings 34, 40 and closure members 35, 41 for the access openings, a gas tight swivel fitting 36 at one end for supporting the fixture, said swivel fitting being adapted to house the power supply leads 26, 27 for the fixture, and a clip 60, 63 for releasably retaining the other end of the fixture in position but leaving it free to be swung out into a servicing position. The patent to Bissell et al thus discloses the specific type of explosion-proof lighting fixture recited in the claim. The patent to Lee discloses a lighting fixture 2, 3 in a wall mounting comprising a cabinet 1 enclosing the fixture and defining a reflector 17 therefor, a detachable front panel 8, 9, a fitting 3, 4 fixed to the bottom of the cabinet to house the power supply leads, and a clip 14 to releasably retain the lamp in position in the cabinet. It was pointed out that the Bissell et al fixture could be used in a wall mounting or cabinet if desired and that the Lee cabinet could be recessed in a wall and used as a film illuminating means in operating rooms if so desired. It was held that in view of Lee no invention would be involved in merely providing the Bissell et al fixture with an enclosing cabinet. Or, considered in the converse order, that no invention would be involved in merely substituting the Bissell et al lighting fixture for the lighting fixture disclosed by Lee in the Lee cabinet.

On page 12 of the brief reference is made to applicant's affidavit under Rule 132 filed February 13, 1952 and to the letter, the affidavit of Edward W. Osann, Jr., and the Test

Report filed April 22, 1953. It is contended that these papers establish "that the wire gauze or screening disclosed in the prior art is not, in fact, the patentable equivalent of the rigid porous metallic panel disclosed and claimed by appellant".

The affidavit under Rule 132 discusses the underwriter's requirements for explosionproof lamps and tests of applicant's device when completely sealed and when provided with porous plugs. The affidavit further sets forth the applicant's conclusions as to the devices of the prior art. The letter and affidavit filed April 22, 1953 requests reconsideration of the final rejection and points out in affidavit form how counsel in the case advised applicant and his assignee to proceed. The Test Report relates to comparative tests made using a fine wire mesh plug and plugs of porous material. It does not appear from the report that the standards and conditions were the same for the test using the mesh and the tests using the porous metal. It does not appear that the fixture tested was the same as the fixture disclosed in the application. For example, the Report states "Three of the openings . . . were sealed with solid metal end covers. . . . The threaded end cover with fine mesh copped screen was then screwed tightly into place . . .". It thus appears that only a single opening was closed by the mesh or porous material. The fixture disclosed has five openings closed by porous plugs. The Test Report and the other papers are not conclusive as to the question of patentability of the claims over the prior art. As pointed out in the Office action of October 24, 1952 patentability cannot be predicated merely on the relative differences in explosive forces which may occur in a fixture.

It is believed that the final rejection is proper for the reasons stated and that it should be sustained.

Respectfully submitted,

Examiner, Div. 69.

IN THE UNITED STATES PATENT OFFICE

BEFORE THE BOARD OF APPEALS

Ex parte Nils A. Tornblom

Application for Patent filed December 3, 1947, Serial No. 789,444. Explosionproof Light Fixture.

Carlson, Pitzner, Hubbard & Wolfe for appellant.

This is an appeal from the action of the Examiner finally rejecting claims 14, 15, 16, 18 through 23 and 25, which are the only claims remaining in the application.

Claims 14, 16 and 20 are illustrative and read as follows:

> 14. In an explosionproof fluorescent lighting fixture, the combination comprising a first end casing having internal partition walls defining terminal and lamp and ballast chambers with connecting passages therebetween, gas seal plugs disposed in certain ones of said passages, said plugs being adapted to isolate mechanically but not electrically said terminal chamber from said lamp and ballast chambers, a second end casing having lamp and switch chambers in direct communication with each other, means including at least one protective glass tube connecting the lamp and switch chambers of said second casing with the lamp and ballast chambers of said first casing, a hollow strut interposed between said end casings, and another gas seal plug housed within said first end casing but precluding mechanical and not electrical communication between said terminal chamber and said second casing via said strut.

16. In an electric lighting fixture, an explosionproof fixture casing enclosed partially by a solid impervious wall having a detachable portion and partially by a rigid pervious wall of porous metal integral with said detachable portion of said impervious wall.

20. In an explosionproof lighting fixture having an internally partitioned casing including a pair of chambers sealed each from the other against the passage of gas therebetween, said chambers having electrical components therein and access openings to the exterior of said fixture, the combination comprising closure members for said access openings, and rigid porous metallic panels unitary with said closure members, said panels being adapted to dissipate gas pressure resulting from internal explosions within said chambers while arresting the passasge of flame therefrom.

The references relied upon are:

Williams	321,166	June 30, 1885
Keil	489,150	Jan. 3, 1893
Tornblom	2,392,202	Jan. 1, 1946
Baker	2,447,048	Aug. 17, 1948
Bissell et al	2,476,352	July 19, 1949
Suter	2,489,686	Nov. 29, 1949
Gover (British)	23,369	A.D. 1897
Lee (British)	449,810	July 6, 1936

The appealed claims relate to an explosionproof fluorescent lighting fixture adapted to be mounted in a recess in a wall of a room, the object being to avoid the transmission of an explosion which might occur inside the fixture to the space outside the fixture. The essential feature in this regard appears to be the use of a porous disc of sintered mental as a portion of a detachable cover for an aperture in the fixture. This structure is described in detail on pages 5 through 10 of appellant's brief.

Claims 14 and 15 are directed to the structural arrangement of the fixture, including its division into isolated compartments. These claims stand rejected as being unpatentable over Tornblom in view of either the patent to Bissell et al. or the patent to Suter. The Tornblom patent discloses an explosionproof fluorescent lighting fixture comprising a pair of spaced apart end casings 10, 20, each provided with apertures for mounting fluorescent lamps and protective glass tubes therearound. The upper parts of the spaced casings are connected by a housing 41 inside of which is disposed a housing 15 for a transformer, which housing is connected at each end to the respective end casings by tubes 18. The upper portion of each end casing is formed into a compartment separated from the lower portion in which the lamps are mounted by an insulating plug 37, which acts as a flame seal therebetween. The upper compartment is utilized as a terminal chamber and the covers 39 and 40 are provided for apertures in the respective compartments to provide access thereto.

The Bissell et al. patent discloses a similar fluorescent lighting fixture in which opposite ends of the fluorescent lamps are mounted in end casings 32 and 38 which are spaced apart by protective glass tubes and hollow struts 44. A casing 20 is disposed transversely of the fixture at one end thereof and a transformer or ballast element is housed therein. This casing is connected to each of the end casings at that end by a junction member 36, which forms a flameproof joint. Electrical conductors, extending through the tubular connections 36, are shown in the drawing as passing through a plug hatched as insulating material.

Suter discloses a mounting for a fluorescent lamp, including spaced end housings in one of which is mounted a ballast element 41. The two end housings are spaced by supporting tubes which serve also as conduits for electrical conductors.

The Examiner considers that claim 14 distinguishes from the Tornblom patent only in requiring a ballast chamber in one of the end casings, whereas, in Tornblom the corresponding element is mounted centrally of the lamps in the connecting housing 15. He considers that there would be no invention in modifying this structure to provide the ballast element in a housing at one end of the fixture in view of the disclosure of this arrangement in the Bissell et al. and Suter patents. He considers that claim 15 is unpatentable over the Tornblom patent alone since this claim does not recite the location of a ballast element.

Appellant argues that the references applied by the Examiner do not disclose the specific compartmentation and casing construction recited in these claims. He further argues that none of the references applied by the Examiner disclose a switch chamber in the second of the spaced casings. Specifically, he contends that the references do not disclose internal bosses in the end chambers which define a central terminal chamber and lamp chambers at either side thereof. He also notes that in the Tornblom patent the ballast is remote from the end casings.

In our opinion there would be no invention, as held by the examiner, in modifying one of the end casings of the Tornblom patent to include a chamber housing the ballast element in view of the disclosure of this arrangement of elements by both Bissell et al. and Suter. It appears to us that this choice of location would amount to no more than the exercise of skill in the art by a designer of such fixtures. Further, Tornblom discloses the use of an insulating plug for the prevention of flame propogation between the upper and lower chambers of his end casing and we deem it a matter of no more than skill in the art to use similar seals wherever it appears desirable. It may be that the precise structure recited in claims 14 and 15 is not found in the references but, in our opinion, the exact location of the respective chambers in relation to each other is not inventive but is merely a matter of routine design which does not significantly affect the installation or operation of the fixture in the intended manner. Similarly we consider the provision of a switch in a chamber in one of the end casings as merely a matter of choice based on whether or not a switch is desired at the lamp itself. As noted by the Examiner, claim 15 does not recite the ballast element and its housing and we note further that it does not require a switch. Accordingly we consider that the Examiner's rejection of this claim on the reference Tornblom alone was proper. In view of the above we will sustain the rejection of claims 14 and 15.

Claims 16, 18 and 19 are directed to the provision in an electric lighting fixture of a casing, a detachable portion of which comprises a pervious wall. These claims stand rejected as being unpatentable over any of the patents to Keil, Williams, or Baker or the British patent to Gover.

The patent to Keil discloses a fixture for mounting an incandescent electric lamp for use in mines in which the lamp is surrounded laterally by a porous metal gauze supported in generally circular end members at either end of the lamp. The metal gauze serves to prevent the ignition of gases which might be present in the event of the destruction of the envelope of the incandescent lamp. The Williams patent discloses a generally similar device for an oil lamp, the wire gauze serving to prevent the ignition of combustible gases outside of the lamp.

The Baker patent discloses the use of a porous metal disc, formed by sintering together bronze metal particles, in the tubes supplying gas to a blowpipe, or the like, so as to prevent backfiring from the flame of the blowpipe back to the source of supply of the gas. The porous disc is clamped in place in a recessed upper member by a correspondingly shaped lower member, which is held in place by bolts.

Gover discloses an electric fuse mounting, the cover of which comprises a sylindrical casing C, the opening at the top of which is closed by a piece of wire gauze W provided for the purpose of permitting the exit of gases under pressure but preventing the communication of flame to the exterior of the device. It is stated that other pervious material may be used.

The Examiner considers that the Keil device is an explosionproof fixture casing as recited by the claims and he takes the position that the metal gauze portion is the equivalent of a porous metallic wall as required by claim 16 or "sintered metallic panel" as recited in claims 18 and 19. He further considers that Williams, Gover and Baker each discloses a fixture casing including a detachable portion in a solid wall which is partially formed of porous material. He states that it would be merely a matter of choice or judgment to use the flame-arresting elements of Williams, Gover or Baker in an electric lighting fixture. He takes the position that the reference devices are all designed with the same basic function in mind as is utilized in appellant's structure, namely, that of preventing the propagation of combustion through a porous member.

Appellant denies that the wire gauze of Keil, Williams and Gover is the equivalent of the rigid pervious wall of porous metal used in his structure. In support of this he has submitted an affidavit setting out reasons therefor and he also has filed an affidavit setting out the results of tests purporting to compare the action of closure discs made of porous sintered metal as compared with closures utilizing wire gauze. The attached photograph taken of the result using metal gauze appears to show that the closure using metal gauze was not entirely effective in preventing the transmission of flame as a result of an explosion internally of the fixture, whereas, the photograph illustrating the results using the sintered metal closure showed no evidence of flame outside the fixture. The Examiner apparently attaches no weight to either the affidavits or the report of the comparative tests, stating as to the latter that the standards and conditions do not appear to be uniform for the mesh and for the sintered metal. He likewise questions the identity of the fixture tested with respect to that of the present application.

We think that the Examiner's criticism of the report of the comparative tests is not justified. An explosive mixture was introduced into the fixture and ignited and adjustments in the mixture were made to obtain explosions of comparable force in connection with both types of closures and, while the fixture tested may not have been identical with that disclosed in the present application, it is not apparent to us that the results of the tests could be attributed to any such differences in structure. However, giving full weight to the result of the tests, we are of the opinion that claim 16 does not recite the porous metal portion with sufficient particularity to distinguish over the wire gauze used by the Keil, Williams and Gover references. We consider that the term "porous metal" used in claim 16 does not exclude wire gauze. Neither do we consider that the term "rigid" avoids such material which has at least some rigidity. In view of this construction we agree with the Examiner that the lamp fixture of Keil fulfills the requirements of this claim. We also agree with the Examiner that the use of a detachable closure member comprising a portion of metal gauze, as used by Gover and Williams, or the sintered metal disc of Baker in an electric lighting fixture would not amount to invention since the pervious element in each of these references is used for basically the same purpose of prevention of the propagation of combustion. Accordingly we will sustain the rejection of claim 16.

Claims 18 and 19 are more specific in requiring a "sintered metallic panel" and, in our opinion, particularly in view of the result of the tests discussed above, the wire gauze, such as used by Keil and Williams, cannot be said to be the full equivalent of such a panel and we therefore will not sustain the rejection of claims 18 and 19 in so far as it is based on these references. The flame-arresting element of Baker is a sintered metallic panel, such as required by claims 18 and 19, and while Baker does not disclose its use in an electric lighting fixture, we are of the opinion that patentable significance should not be attached to the broad reference to electric lighting fixtures in the claims under consideration. The parts 17 and 18 of the Baker disclosure can, we think, be properly termed "a fitting" and we find nothing recited in these claims which would lend patentable significance to the use in the introductory phrase of these claims of the modifiers "electric lighting". In considering the Gover reference we note that the fuse housing there disclosed can be termed an electric fixture and we further note the reference to the possibility of using pervious material other than wire gauze specifically mentioned. In view of this disclosure we consider that the use of a sintered metal element in the Gover housing would amount to merely a selection of a well known material exemplified by the Baker disclosure discussed above. Similarly, as discussed in connection with the Baker reference, we do not regard the term "lighting" used in the introductory phrase of each of these claims as being of patentable significance. Accordingly we will sustain the rejection of claims 18 and 19 in so far as it is based on the Baker and Gover references.

Claims 20 through 23 stand rejected as being unpatentable over either Tornblom or Bissell et al, each in view of either Williams or Baker. These claims recite, in varying detail, structural features such as are recited in claims 14 and 15, discussed above, with the additional recitation of closure members for access openings, which closure members comprise "rigid porous metallic" panels or plates. The Examiner considers that in view of the closure member of Williams, which is provided with a wire gauze diaphragm g, or the sintered metal flame-arrester element of Baker, that there would be no invention in providing such a member as a part of the detachable covers of Tornblom or Bissell et al. Appellant argues that there is nothing in any of the references to suggest the use of porous metallic panels as a part of the detachable covers as proposed by the Examiner since the closures of Tornblom and Bissell et al. are disclosed as impervious and the Williams and Baker patents do not disclose explosion-proof lighting fixtures.

We are not persuaded by appellant's arguments. While there may be no explicit suggestion for the modification of the detachable covers of Tornblom and Bissell et al, we are of the opinion that one skilled in the art, with the disclosures of the applied references before him, would find the proposed modification obvious. We will therefrom sustain the rejection of claims 20 through 23.

Claim 25 is directed to the mounting of the fixture, discussed above, in a cabinet with a detachable panel, the mounting fixture being fastened to the cabinet at the bottom by a gas tight swivel fitting so as to permit the tilting of the fixture outwardly to facilitate servicing. This claim stands rejected as being unpatentable over Bissell et al. in view of the British patent to Lee or *vice versa.* Lee discloses his discharge lamp 2 mounted in a wall cabinet provided with an inner reflector. A ballast element is disposed in a lower chamber of the cabinet. A detachable flame tight cover is provided on the front of the cabinet and a clip 14 at the top releasably retains the lamp in position. The Examiner considers that the Bissell et al. patent discloses a mounting fixture with a swivel fitting 36 at one end to permit tilting and he takes the position that there would be no invention in mounting such a fixture in a wall cabinet, such as disclosed by Lee.

Appellant contends that there is no suggestion in Bissell et al. that the lighting fixture could or should be mounted in a cabinet, such as that of Lee, and further, that any such mounting would require considerable modification of the structures of both patents. He further argues that there is no reason to assume that the modified structure would include a gas tight swivel, such as is required by claim 25, and he further contends that it is not apparent how the swivel fitting 36 of Bissell et al. could be fixed at the bottom of the cabinet for supporting the fixture as required by the claim.

We are of the opinion that claim 25 is unpatentable over the combination of references as applied by the Examiner. Figs. 6 through 11 of Bissell et al. illustrate a modification of their fixture, including swivel joints along a horizontal axis to permit tilting of the mountings with respect to the ballast housing. The protective member 36 is described as forming a flame-tight connection as used in Figs. 1 through 5 and we thing it reasonable to assume that the same type of connection is provided in the modification of Figs. 6 through 11 since the connection member is given the same reference numeral in all figures. Further, it is our opinion that one skilled in the art would have no particular difficulty in designing the cabinet of Lee of such dimensions and proportions as to accommodate the mounting disclosed by Bissell et al. Moreover, we consider that there would be no particular difficulty involved in mounting the Bissell et al. fixture with the swivel joint at the bottom thereof as recited in the claim under consideration. We therefore will sustain the rejection of claim 25.

The decision of the Examiner is affirmed.

Mark Taylor,
Examiner-in-Chief.
M. H. Friedman,
Examiner-in-Chief (Acting),
P. T. Dracopoulos,
Examiner-in-Chief (Acting),
Board of Appeals.

May 28, 1954
Carlson, Pitzner, Hubbard & Wolfe
One North LaSalle St.
Chicago 2, Illinois

2

EXCERPTS FROM TESTIMONY AND PROCEEDINGS

Before proceedings further with my opening, I should like at this time to withdraw three of the ten claims in the complaint and move to dismiss the compaint as to these claims. I refer to Claims 14, 15 and 25.

That would leave in the case Claim 16 and 18 to 23, inclusive.

The Court: You are dismissing 14 and 15?

Mr. Osann: Yes, sir, and 25.

* * * * * * * * * *

3 Mr. Osann: And there is one more point, Your Honor. I would like to move to drop Nils A. Tornblom as a party plaintiff in view of his demise since the filing of this suit.

The Court: You are not substituting his executor or administrator?

Mr. Osann: No, sir, he is not a necessary party, since the application has been assigned to the other plaintiff.

Mr. Cochran: There will be no objection to that, Your Honor.

The Court: Very well.

Mr. Osann: May it please Your Honor, the plaintiff, Appleton Electric Company, is an Illinois corporation engaged in the business of manufacturing industrial 4 lighting fixtures, electrical fittings, and wiring hardware, and other electrical items.

Assignment of application Serial No. 789,444 and the invention thereof to the plaintiff is conceded.

* * * * * * * * * *

16 I would like to offer as Plaintiff's Exhibit 1 a certified copy of the file wrapper and contents.

Mr. Cochran: No objection.

The Court: It will be admitted.

(The document was received in evidence and marked Plaintiff's Exhibit No. 1.)

Mr. Osann: I would like to offer as Plaintiff's Exhibit No. 2 a binder of the references cited by the Patent Office
during the prosecution of the application, on the
17 basis that that is what they would go in for, and
they are not offered on the basis of proving the truth
of the statements therein contained.

The Court: I understand.

Mr. Cochran: Io objection. It duplicates what we will offer, but there is no objection at this time.

The Court: It may be admitted.

(The document was received in evidence and marked Plaintiff's Exhibit No. 2.)

Mr. Osann: I would like to offer as Plaintiff's Exhibit 3 a convenience copy, smooth typed of the specifications, the claims in issue and application drawings.

The Court: That is one you have already handed to the Court informally; is that it?

Mr. Osann: Yes, Your Honor.

The Court: It may be admitted.

(The document was received in evidence and marked Plaintiff's Exhibit No. 3.)

Mr. Osann: Now, I would like to have Mr. Stephen T. Skrydlak come forward.

Thereupon,

Stephen T. Skrydlak

was called as a witness by the plaintiff and, being first duly sworn, was examined and testified as follows:

18 Direct Examination

By Mr. Osann:

Q. What is your full name and address? A. My full name is Stephen Thomas Skrydlak. I reside at 41 North Warwick Avenue in Westmont, Illinois.

The Court: What is your last name?

The Witness: My last name is Skrydlak.

The Court: Speak up, you are in a big courtroom.

The Witness: My last name is Skrydlak.

The Court: How is that spelled?

The Witness: S-k-r-y-d-l-a-k.

The Court: Spell it again and slower.

The Witness: S-k-r-y-d-l-a-k.

The Court: What is your first name?

The Witness: Stephen.

By Mr. Osann:

Q. Mr. Skrydlak, what is your present occupation or business? A. I am a patent attorney.

Q. What formal education have you had in law, if any? A. I have had——

The Court: Oh, well, if he is an attorney, I think that is sufficient so far as his legal education is concerned.

By Mr. Osann:

19 Q. You are admitted to practice in the State of Illinois? A. I am.

Q. And you are admitted to practice before the United States Patent Office? A. I am.

Q. How long have you been engaged in the practice of patent law? A. About one year and one month.

Q. What did you do prior to entering the law profession? A. I was a chemical engineer.

Q. How long were you so employed? A. A little over 10 years.

Q. Where was your last employment as a chemical as a chemical engineer? A. At Underwriters Laboratories, Incorporated.

The Court: I think you have qualified this witness sufficiently.

Mr. Osann: Is there any objection to the witness' qualifications?

The Court: You may proceed.

By Mr. Osann:

Q. You have had a formal education in chemistry and technical subjects? A. Yes, I have a degree in chemistry.

20 Q. When did you obtain that degree?

The Court: He said he is a chemical engineer. The Court is satisfied with the qualifications.

By Mr. Osann:

Q. Mr. Skrydlak, you mentioned working for Underwriters Laboratories, Incorporated? A. That is right.

Q. What is that organization?

The Court: I am not interested in that. Let us get to the case.

Mr. Osann: Your Honor, if I might explain, Underwriters Laboratories did some of the laboratory tests which we want to put evidence in on, and I would like to have something in the record on that.

The Court: Well, you have made the statement. That is enough.

By Mr. Osann:

Q. What positions or titles did you have at Underwriters Laboratories? A. I was a chemist and a chemical engineer at various times.

Q. And you were——

The Court: Now, I will hear no more about the qualifications.

Get to the case, Mr. Osann. Don't let's waste
21 time. I am not interested in the witness' life history.
You have qualified the witness.

Mr. Osann: I have some more questions that have to do with or bear on his work at Underwriters Laboratories.

The Court: I am not interested in that. Let us get to the case. Is this for the purpose of qualifying him?

Mr. Osann: No, sir, but they lay the background for the tests.

The Court: Do not let us have any background. Let us get to the issues and to the relevant testimony.

By Mr. Osann:

Q. You did testing work at Underwriters Laboratories? A. I did.

Q. Were you assigned to any particular type of testing there? A. I was. I tested——

The Court: Now, let us get to the case. Let us have no more preliminaries.

Mr. Osann: Your Honor, what I am trying to do is to qualify this man as an expert in the field of explosionproof——

The Court: Well, the Court is accepting him as an expert. I never permit counsel, unless there is a dispute, to consume unnecessary time qualifying witnesses.

Now, will you proceed with your next question
22 that bears on the issues of this case?

By Mr. Osann:

Q. At Underwriters Laboratories, Mr. Skrydlak, did you text explosionproof light fixtures? A. I did.

Q. What was the purpose of the testing of these fixtures? A. Well, we determined by means of our tests and investigations as to whether these fixtures would operate safely in these hazardous locations for which they were submitted, of which there are different classes and groups.

Q. And Underwriters Laboratories has a wide variety of equipment for making these tests? A. Yes, they do.

The Court: I assume they have. Now, let's get to the case.

By Mr. Osann:

Q. You are familiar with that equipment? A. Yes, I operated all the equipment in the explosive departments.

Q. Mr. Skrydlak, would you explain in general the various types of locations which are considered or might be considered hazardous areas? A. Oh, yes. It is broken

into Class 1, which is gases or vapors, which might
23 be hazardous in nature when mixed in sufficient concentration
of air, such as acetylene, known as Group A; and there is hydrogen and other similar gases, known as Group B; and C is represented by ethyl, ether, cyclohexin, and other gases of like nature; and then we have D which is gasoline and naphtha, and other similar hazardous vapors and gas.

Then we have Class 2, which is dust. There are dusts which when mixed in air are combustible, and may explode, or as the result of laying on fixtures for electrical equipment which will generate heat, combust and cause a serious explosion and damage to life and property.

Q. Can you give us examples of locations where these various classes of hazardous situations exist? A. Oil refineries, where there is gasoline being distilled or purified; operating rooms, where you have ether vapors; in the chemical manufacturing industry, for extraction, where they use such products as solvents; and Class No. 2, which is dust, in coal mines such as coal dust, in flour mills, where they grind flour and it is so highly combustible; and in a plant where there is magnesium or aluminum dust, which is very highly inflammable when igited or subject to a spark, or to heat beyond the ignition point of that particular substance.

Q. What are some of the commonly encountered
24 explosive mixtures in these locations? A. Well, the
most common of the liquid and gases and vapor is gasoline; and the next common is ether.

Q. Are there any others which would be common or frequently found in such areas? A. Well, we have our dusts; ether vapors I mentioned; and gasoline and methane, which is in coal mines, and natural gas, which may be found in coal mines.

Q. Mr. Skrydlak, can light fixtures and switches be safely located in such hazardous areas without special precautions? A. Well, no, sir; but the ordinary lighting fixtures.

Q. What is the basis of your answer? A. Well, in the event of actuation of the electric mechanism which is inside of the enclosure of an ordinary switch or electrical device, the results are an arc, and that arc is of sufficient intensity to ignite the explosive mixture which may have permeated inside of the enclosure, and as a result there is an explosion of such force that it will leave the enclosure, and the flame resulting therefrom will ignite the mixture that is explosive in the surrounding area in which the device is being used.

Q. And what are some of the common causes of a spark inside of the fixture? A. Actuation of the switch mechanism, especially on the break side, that is, Your Honor, when you throw it off, after it has been on, it creates a very serious arc; a broken wire, or a defect in the mechanical construction of the mechanism, which will cause an arc.

Q. You give a special term than to fixures that are used in hazardous areas? A. Yes, sir; they are designated as explosionproof.

Q. Mr. Skrydlak, in a hazardous area would it be possible to eliminate the danger of an explosion simply by taking an ordinary light fixture and enclosing the whole thing in a gas-tight housing or enclosure? A. Well, as a practical matter, I would say, no, because in order to hermetically seal a device like that, you must have access into the interior of the device likewise. In order to operate the mechanism, there must be some sort of a shaft or switch mechanism operating that, which will have an exit from the inside of the interior, and likewise, it is not to prevent an explosion inside of the device but to prevent the ignition of the explosive mixture outside. As I might illustrate, that gases have been known over a long period of time to seep through by some means into the wall, into any minute opening that might exist in the fixture, and it has been known and determined by specific tests at Underwriters Bureau of Research.

Q. Prior to December 3, 1947, Mr. Skrydlak, were there explosionproof lighting fixtures known and avail-
26 able? A. Oh, yes.

Q. Will you indicate, please, what the nature of such fixtures was at that time? A. Well, the nature of such fixtures was—you mean, its construction, sir?

Q. Yes, it complete construction. A. Well, they are generally of the heavy wall material, a cast metal which was enclosed by joints of sufficient length and had a tolerance of very minute dimensions, which would prevent any flame or explosion that was created inside from reaching the outside area where the gases were. Likewise, if they used any threads for bonding any parts together, these were fitted together in such a way that it was a considerable length along these threads, which also acted as a long flame path, I should say, to prevent any flame from leaving along this path, along the threads.

To illustrate it, they were usually of heavy wall cast construction and very bulky and of considerable weight.

Q. You have described what you call a heavy wall fixtures. Was there another type of fixture that was known in the art prior to December 3, 1947? A. Well, of the lighting fixtures, there was one or two mentioned before, which was built with a pressure of inner gas and which prevented an explosion from occurring inside of the mixture.
27 This required some means of pumping a gas and keeping it under pressure at all times in order that it was higher inside of the fixture than it was in the surrounding area in which the fixture was mounted.

Q. Did it require auxiliary equipment to maintain the inert gas inside of the fixture at a higher pressure than the surrounding area? A. They usually pump, which is connected to some means of priming equipment or devices which would go on and off, depending on the value of the pressure that had to be maintained inside of the fixture.

If it fell below this value, it would automatically open and remain inoperative until it was refilled with the inner gas of a higher pressure.

Q. In a gas filled or in an inert gas filled fixture, such as you described, if the pressure were to fall to atmospheric, would there then be a tendency for the explosive mixture in the surrounding atmosphere to seep into the fixture? A. Yes, there would. There would be a flow in both directions.

Q. Would there be then under those conditions the likelihood of an internal explosion? A. There would be if an arc resulted inside of the enclosure.

Q. Are there any other disadvantages of the so-called
pressure filled type explosionproof lighting fixtures,
28 other than the ones you have mentioned? A. Well,
there is extreme maintenance and care that must be
exercised in keeping them operative. Likewise, they are a nuisance, and if the pressure inside does fall below the safe limits, if you need light, it is inoperative, and it requires a lot of service.

Also, the expense of manufacturing these devices has increased because of these switches, which are inserted inside, which are all pressure responsive and naturally are more costly in the field than the ordinary switch that is used in the ordinary fixture.

Q. Mr. Skrydlak, going back now to the heavy wall explosionproof fixture, what happens in the event of a spark inside of that fixture? Well, the spark will ignite the explosive mixture inside of the housing, and there will be an explosion of such force and intensity that there is a shock dissipated against the walls of the fixture, and the flame and the spark resulting from the explosion will be confined inside of the enclosure and not be permitted to ignite the surrounding mixture because of the path and shaft opening there provided.

Q. Does the pressure from such an explosion tend to get very high? A. Yes ,sir, they are very high in some instances; in mose instances, I would say.

29 Q. Must that be taken into account in designing
the walls and other structure of such fixtures? A. It

must be taken into account because the walls must be strong enough to withstand that pressure.

Q. Mr. Skrydlak, what, if any, disadvantages are there in the heavy wall type explosionproof lighting fixture? A. Well, they are bulky. They are very heavy, and they usually require special mounting because of the considerable weight; and they require—well, the fittings that are used in connecting them to the source of supply are all special and of heavy wall construction as well.

Q. Mr. Skrydlak, does Underwriters Laboratories give approval of heavy wall type lighting fixtures? A. They do.

Q. On what basis do they give such approval? A. On the successful completion of all these tests and requirement examinations that are set up by the laboratory standards.

Q. Briefly, what tests are required by these laboratory standards? A. The lighting fixture when it is submitted, it is first examined to determine whether its construction details are in compliance with the requirements that are set up by the laboratory, which are as the result of tests done by the laboratories.

After the examination, if they are found to be satisfactory, and within the standards, they are then subjected to a series of tests.

In the case of a lighting fixture, the lamp is allowed to heat and all the temperatures on the exterior surface of the lamp are measured to determine the maximum point that is reached. After that they are prepared for an explosion test to determine their satisfactory performance in the hazardous location for which they have been submitted, to determine whether they will propagate any surrounding mixture of gases.

Likewise, after these tests are completed in an explosive atmosphere, they are given a test under hydrostatic conditions, usually water pressure, at which time they are subjected to a pressure of equal four times the amount of pressure received in explosions, namely, if a fixture reached a maximum 150 in explosion tests, it would have to withstand 600 pounds per square inch in the hydrostatic test.

Q. Mr. Skrydlak, have you read the specifications, studied the drawings, and read Claims 16, 18, 19, 20, 21, 22 and 23 in the Tornblom application, Serial No. 789,444? A. I have, sir.

Q. Have you also read and are you familiar with the Examiner's final rejection, the brief on appeal to the Board
of Appeals, and the Examiner's answer on appeal,
31 and the decision of the Board of Appeals in the file
of patent application, Serial 789,444? A. I have
read all those documents and I am familiar with them.

Mr. Osann: I have three charts, Your Honor, which I would like marked as Plaintiffs' Exhibits 4-A, 4-B and 4-C for identification.

(The documents were marked Plaintiff's Exhibits No. 4-A, 4-B and 4-C for identification, respectively.)

By Mr. Osann:

Q. I hand you, Mr. Skrydlak, these charts, Plaintiffs' Exhibit 4-A, B, and C for identification, and ask you to identify them if you can. A. Well, they are enlarge reproductions of the drawings which are in the application, of the Tornblom application.

Q. And do they accurately correspond to the patent?

The Court: I will assume they do. In this Court we dispense with all the formalities.

Mr. Osann: I appreciate that, Your Honor.

I would like to offer in evidence these charts.

The Court: Well, you don't have to offer them in evidence. They are just enlargements of the other charts, are they not?

Mr. Osann: Yes, sir.

The Court: For illustration purposes.

32 Mr. Osann: Yes, sir, but he would testify from
them, and I thought they might be offered in evidence.

The Court: Very well. You may offer them in evidence.

(The documents previously marked for identification as Plaintiffs' Exhibits 4-A, B and C, respectively, were received in evidence.)

Mr. Osann: I have a physical exhibit, Your Honor, which I would like to have marked.

The Court: Well, no, we won't mark that. A tag can be attached to that.

Are you offering it in evidence?

Mr. Osann: Yes, sir.

The Court: What is it? Describe it on the record.

Mr. Osann: The testimony of the witness will show——

The Court: No; what are you offering in evidence?

Mr. Osann: I am offering in evidence a complete explosionproof lighting fixture.

The Court: Well, is that the fixture of the plaintiffs' application?

Mr. Osann: Made under the application.

The Court: Well, that is what I want to know. In other words, that is the invention.

33 Mr. Osann: That is one form of the invention, Your Honor.

The Court: It may be admitted.

(The object was received in evidence and marked Plaintiffs' Exhibit No. 5.)

By Mr. Osann:

Mr. Skrydlak, have you compared the fixture, Plaintiffs' Exhibit 5, with the disclosure and claims and drawings of the prints?

The Court: I assume he has. Omit the preliminaries and get to the point. Of course, he is prepared to testify.

By Mr. Osann:

Q. Does this fixture, Plaintiffs' Exhibit 5, correspond in all material respects to the fixture disclosed and claimed in Tornblom application, Serial No. 789,444, here in suit? A. It does.

The Court: I would like to ask you this, Mr. Osann. Is it the plaintiffs' contention that this apparatus corresponds to all the claims or only some of the claims in suit?

Mr. Osann: Your Honor, it is plaintiffs' position that this fixture embodies the invention covered in all of the claims in the application, except 22 and 23.

The Court: How do those two claims differ from
34 the others?

Mr. Osann: In recitation of certain caps having porous metal, Your Honor.

The Court: In other words, those two claims are narrow claims, is that it, and some of the features of those narrow claims are not embodied in this apparatus; is that it?

Mr. Osann: Some of the narrower claims in the application call for something which does not quite correspond to what is in the fixture, and the difference is in the number and distribution of the caps with the porous metal.

The Court: Very well.

By Mr. Osann:

Q. Mr. Skrydlak——

First, Your Honor, I would like the record to show formally that I am offering Plaintiffs' Exhibit 5 in evidence.

The Court: Very well.

By Mr. Osann:

Q. Mr. Skrydlak, when did you first see a fixture such as Plaintiffs' Exhibit 5? A. In the year 1947 while I was at the laboratories?

By the Court:

Q. 1947? A. Yes, sir.

By Mr. Osann:

35 Q. What laboratories? A. At Underwriters Laboratories, Inc.; I am sorry.

Q. Under what circumstances? A. I was on the staff of Underwriters Laboratories as a chemical engineer at the time investigating explosionproof fixtures for use in hazardous locations.

Q. Did you at that time examine the physical design of that fixture in some detail? A. I did; in great detail.

Q. Did Underwriters Laboratories test that fixture and grant approval of it as being safe in hazardous atmospheres? A. They did.

Q. And did you participate in those tests? A. Yes, sir, I did.

Q. Did Underwriters Laboratories then prepare a report granting approval or an approved listing based on the results of those tests? A. They did.

Mr. Osann: I have a document, Your Honor, which I ask to be marked Plaintiffs' Exhibit 6.

The Court: Well, are you going to offer it in evidence?

Mr. Osann: Yes, sir.

The Court: Well, suppose you offer it in evidence now, instead of going through the process twice.

What is it?

36 Mr. Osann: I thought he would identify it first, Your Honor.

The Court: You don't have to identify it, do you?

Mr. Osann: I would like to offer in evidence at this time as Plaintiffs' Exhibit 6 a copy of the Underwriters Laboratories report which the witness mentioned in his testimony.

Mr. Cochran: If Your Honor please——

The Court: What is the date of it?

Mr. Osann: The date is December 5, 1947. It appears on the inside page.

The Court: Mr. Cochran.

Mr. Cochran: If Your Honor please, it has not been brought out what was the purpose of this test. As I said in the opening statement, it is no longer in issue whether the sintered metal was better than wire gauze. If that is the purpose of the test, I don't think it is relevant.

The Court: What is no longer in issue?

Mr. Cochran: Whether a sintered metal type of flame arrester does a better job than a wire gauze flame arrester.

The Court: You concede that it does?

Mr. Cochran: Yes, sir, the Board said so.

Mr. Osann: Well, Your Honor, I think——

The Court: Are you objecting to this exhibit?

37 Mr. Cochran: Not knowing what the purpose of the test was, I am; yes, sir.

Mr. Osann: The purpose of these tests, Your Honor, is to show that this fixture, which was made under the application of the patent application in suit, was tested and approved by Underwriters Laboratories for use in hazardous locations.

The Court: I am going to admit the exhibit.

(The document was received in evidence and marked Plaintiffs' Exhibit No. 6.)

By Mr. Osann:

Q. Mr. Skrydlak, I am going to ask you to step over to the blackboard, if I may, and ask you to explain in your own words the construction and operation of the fixture shown in the Tornblom application, Serial No. 789,444, and as represented in Plaintiffs' Exhibit 5.

Is this legible, Your Honor?

The Court: Proceed.

The Witness: Here we have an explosionproof lighting fixture——

The Court: Suppose you turn this way. You are quite a distance from the reporter, so you will have to speak clearly and loud enough.

The Witness: Yes, sir.

Here we have an explosionproof lighting fixture
38 as typified by the construction shown. It consist
of an end housing at the top, or casting, which is
secured to the lower end casting by means of a piece of
conduit, which is secured to the housing by means of

thread engagement. Also secured in the recess opening in each of these castings is a glass tube, 18, and further secured in there by means of a sealing ring, which is fitted over the glass and into the recess opening in the end casting.

Likewise, this construction is also the same as the other casting.

As illustrated in this view here——

By Mr. Osann:

Q. You are speaking of Figure 2? A. Yes, sir.

In Figure 2, this side of this casting is continuous and open from end to end, whereas in the casting illustrated in Figure 4, it is divided into chambers, namely, there is a terminal chamber at this point, a chamber for the lamp housing at each end, and a chamber for ballast, which is better illustrated here in Figure 7.

This divides the over-all fixture into a chamber for the ballast, which is continuous with the chamber for the lamps, and a chamber for, at this point, for the terminals.

Inserted in a partition or sealing well in the lower housing are leak seals, at this point here in the
39 lamp chamber, and in this lamp chamber, and also adjacent to this hub, as illustrated here, to divide this fixture into one chamber, which is explosionproof at the terminals, and another——

The Court: Now, may I interrupt you a moment?

I venture to make a suggestion, and I am not trying to tell you how to try your case, but it would be more helpful to the Court if this demonstration could be on the actual appartus rather than drawings. I notice you have a full sized apparatus.

Mr. Osann: Yes, sir, we will be glad to do that, and I appreciate the suggestion.

The Court: The Court can see the apparatus at the place where it is now on the table.

The Witness: Well, if the Court will permit me to have a screwdriver, I will remove these screws in order to see the interior of this lower housing.

The Court: You may do so.

Now, suppose you do that during the luncheon recess. Go ahead as far as you can now without removing them.

The Witness: Well, we have a switch mounted in the upper end housing for actuating these——

The Court: In order that I might get my bearings, Mr. Skrydlak, where is the lamp?

The Witness: The tubes are not in here now, sir, but they are inserted.

The Court: The lamps are inserted?

The Witness: That is right, inserted into holders which are mounted internally, in these castings, and those mountings are secured by means of screws inside.

The Court: There are no lamps in there now?

The Witness: No, no lamps in there now, sir.

By Mr. Osann:

Q. Where does the lamp go? Tell the Court. A. The lamp extends this tube and this tube, and it is fitted into sockets, as a fluorescent fixture does, which I believe Your Honor is acquainted with.

The Court: I see.

The Witness: Each one of the castings is provided with an access opening at the top, to allow the lamps to be inserted or replaced, and also to allow means for entering into to repair a broken wire, or replace a lamp holder, or any electrical device that is inserted therein.

These openings at this point, at the upper part and at the lower part, and likewise there is a like access opening in the chamber opposite the terminals, are provided with these caps, which are engaged in the openings by means of thread engagements.

These caps are also provided—they are not illustrated here—may I have one of those other caps?

41 The Court: Suppose we take our luncheon recess at this time, and during the luncheon recess you can take off the cover or whatever you want to do to finish your demonstration.

The Witness: Thank you.

Mr. Osann: Thank you, Your Honor.

(Thereupon a recess was taken from 12:30 o'clock p. m., until 1:45 o'clock p. m.)

After Recess

(The trial was resumed at 1:45 o'clock p. m., pursuant to the recess.)

The Court: We will proceed with the case on trial. Before we proceed I want to apprise counsel that during the noon recess I read the report of the Board of Examiners or the opinion of the Board of Examiners, and it seems to me that the issue here is very narrow, and that we ought to get down to that one issue, and I am not going to permit you to consume any time to give me any more of the history of the invention and things of that sort, except as it bears on the specific issues raised by the Board.

As I see the principal issue, it is whether the wire gauze of the Keil patent is equivalent to the applicant's porous metal element, is it not? That is the principal issue?

42 Mr. Osann: That is one of the principal issues.

The Court: Well, let us get right down to it.

Now, I want to ask you this, Mr. Osann: Were any claims allowed?

Mr. Osann: No, sir.

The Court: No claims at all?

Mr. Osann: No claims were allowed.

The Court: Now, do you have any specific claims which relate solely to rigid porous metallic elements because I notice that the Board makes the point that the terminology you use is sufficiently broad to include a wire gauze.

Mr. Osann: They make that point, Your Honor, and, of course, we are prepared to show that there is no basis for it.

The Court: Well, do you have any narrow claims which would distinguish from Keil, in other words, limited to a solid rigid porous metal element?

That might offset the Keil reference, according to the Board, might it not?

Mr. Osann: I think so, Your Honor.

The Court: Have you any such claim?

Mr. Osann: Well, Claim 16 calls for a rigid pervious wall of porous metal integral with said detachable portion of said impervious wall. That is Claim 16, Your Honor.

43 The Court: Very well, you may proceed, and I do insist that you confine yourself to the issues of the case.

Mr. Osann: I will do my best, Your Honor.

The Court: No; your best is not enough. You have to do it.

Mr. Osann: Yes, sir. As I understand it, Your Honor, a proceeding of this kind is more than just a mere review of the Patent Office record.

The Court: Well, of course, you are not limited to the Patent Office record. That is a difference, of course, between this case and the Board of Appeals of the Patent Office, but you are limited to the issues of the case.

Mr. Osann: Well, the broad issue of the patentability over the references.

The Court: Not the broad issues. You are limited to the issue whether the references on which the Patent Office relies are sufficient to preclude you from getting the patent.

Mr. Osann: Yes, sir, stated that way, I think so.

The Court: Now just confine yourself to that issue instead of giving me a broad history.

I think we ought to be able to dispose of this case very quickly one way or the other.

Mr. Cochran: Could I say something, Your Honor?

The Court: Yes.

44 Mr. Cochran: I want to make one comment on the issue. On page 8 of the Board of Appeals decision, they disagreed specifically with the Examiner on his criticism of the tests which were——

The Court: Yes, I read that.

Mr. Cochran: And the Board then held, however, giving full weight to the result of the tests, they fail to find that the claims defined either structurally or inventively over the references. I just wanted to point that out. It is not a question of whether the gauze is actually the equivalent to the plaintiffs' claimed arrester, but it is whether the claim defines over the reference, Claim 16, for example, defines over the Keil reference.

The Court: Just a moment. Now, if you gentlemen will turn to page 8 of the opinion of the Board, in the middle of the page, the Board summarized its ruling on this very vital point as follows:

> "We are of the opinion that Claim 16 does not recite the porous metal portion with sufficient particularity to distinguish over the wire gauze used by the Keil, Williams and Gover references. We consider that the term 'porous metal' used in Claim 16 does not exclude wire gauze. Neither do we consider that the term 'rigid' avoids such material which has at least some rigidity. In view of this construction
> 45 we agree with the Examiner that the lamp fixture of Keil fulfills the requirements of this claim."

It seems to me that is the whole crux of the case.

Mr. Osann: Yes, sir, I think it is.

The Court: Very well. Insofar as possible let us confine ourselves to the crux of the case. You know, every case has only one point. The trouble is sometimes that lawyers are either unwilling to see the point or unwilling to adhere to it.

Now, you may proceed.

Mr. Osann: I will ask Mr. Skrydlak to resume his place on the stand, please.

Thereupon,

Stephen T. Skrydlak

resumed the witness stand pursuant to the luncheon recess and testified further as follows:

Direct Examination (Resumed)

By Mr. Osann:

Q. Mr. Skrydlak, just one question about Plaintiffs' Exhibit 6, the Underwriters report.

Calling your attention to the page following page 16, are you the same S. Skrydlak whose name appears there under examined and tested by, that caption? A. Yes, I am.

46 Mr. Osann: Your Honor, prior to the recess the witness was explaining in general the makeup of this fixture which is the embodiment of the application and claims here in suit, and with Your Honor's permission I would like him to resume that explanation.

The Court: Yes. I suggest he do it briefly.

Mr. Osann: Yes, sir, we will be brief.

The Witness: Each of these castings——

By Mr. Osann:

Q. Just a moment, Mr. Skrydlak.

Would it be clearer if we could have the fixture held a little closer to the bench for you, Your Honor?

The Court: No, I can see.

The Witness: Each of these castings at the upper end——

The Court: Well, now, when you turn the other way I cannot hear you.

The Witness: Yes, sir. Each of these castings at the upper end is provided with an access opening to permit entrance into the chambers for repair of elements or replacement of lamps, and these access openings are closed by a cast of metal construction.

The Court: It would be helpful if you point out the important features of this structure rather than every every detail because I do not want to lose sight of the for-
47 est because of the trees.

Mr. Osann: I appreciate that, Your Honor.

The Witness: These caps are made of cast metal and have molded therein or cast therein this disc of porous metal.

Mr. Osann: Hand it up to the Court.

The Clerk: Give it to the Clerk.

In other words, the porous metal is on top of it.

The Witness: It is bonded therein, sir. It is laid against a flange inside of there and then it is molded and cast as one unit.

The Court: Well, I guess I misunderstood. I thought that this porous metal surrounded the whole structure. It does not, does it?

Mr. Osann: No, sir; it forms a part of it.

The Court: It is inserted in the top of the structure; is that it?

Mr. Osann: Yes, sir, it is inserted in the part of the solid wall. It forms a part of the wall of the fixture.

The Court: I see. Or the side of the structure? You said top. It is really the side of it.

The Witness: Well, if it is laid down, sir, it would be.

The Court: How is it erected in actual use?
48 Hold it the way it would be in actual use.

The Witness: This way (indicating).

The Court: Very well. So this is the top of the structure?

The Witness: Yes, sir, that is right; or also at the bottom here.

The Court: In other words, there are four of these?

The Witness: There may be five in all. They are put in this fixture.

The Court: Three at the top and two at the bottom; is that it?

The Witness: Well, these were provided at this end here. However, these caps may be exchanged for the caps on top and the threads are the same size.

Mr. Osann: To save time, Your Honor, the fixture will work with two to five of those units, such as you hold in your hand.

The Court: In other words, the caps contain a porous metal and are either at the top or the bottom of the structure, or both; is that correct?

The Witness: That is right, sir.

The Court: Very well. You may proceed.

The Witness: Well, the over-all enclosure is divided
into a chamber housing and terminals, which is
49 illustrated here, which is isolated from the rest of
the fixture, which contains in continuity the chamber housing, the ballast, your lamps, and the upper chamber in a U-shape or may go all the way around on both sides, so that if an explosion occurs inside of this chamber, it will be isolated from the rest of the chamber. Or, likewise, if it occurs in the chamber housing of the lamp, it will be isolated from the chamber housing or the terminals by reason of the leak seals which I illustrated on the drawing.

I don't think that they are visible here in the fixture because they are confined within.

The Court: Now, repeat that again. You speak so fast, and turn this way, and not have your back to the Court. Turn this way.

The Witness: I am sorry.

In this fixture there is a chamber which houses these terminals, which is isolated by means of leak seals.

By the Court:

Q. Now, what is isolated? For what? A. So that an explosion——

Q. What is isolated? A. Your chamber housing these materials.

Q. I see. A. Is isolated from the——

50 Q. Is isolated from the balance of the apparatus? A. That is right, sir, so that there are two of these chambers which are explosionproof in the general sense of the word.

Q. You mean one at the bottom and one at the top; is that is? A. No, sir. This is one chamber, which is just this little chamber housing these terminals.

The other chamber comprises your ballast housing, the lamp tubes, and this chamber inside which is continuous throughout, so that an explosion, if it occurs in here, is confined to this compartment; an explosion that occurs in the lamp chamber or in this end casing or the ballast housing is confined within that part of the compartment of the over-all fixture.

The Court: Very well.

By Mr. Osann:

Q. Well, is that explosion vented in any way? A. Yes, sir, it is vented by means of these caps.

By the Court:

Q. What do you mean by vented? I suggest you use non-technical terms.

Mr. Osann: Let me reframe the question, Your Honor.

By Mr. Osann:

51 Q. Mr. Skrydlak, if there is an explosion inside this main portion of the fixture, what happens to the pressure of that explosion? A. Well, it is held at a very low value.

By the Court:

Q. What do you mean by held at a low value? A. Well, much lower than if the cap——

Q. What do you mean by value, in that connection? A.

I would say, sir, down around 50 pounds per square inch.

Q. Well, what do you mean by the word "value" in that connection? That is not my conception of the word value at all.

Do you mean the force of the explosion? A. That is right; it is a softer explosion, if that will define it.

Q. Just a moment. You have to get away from technical terms and use plain English. A. Yes, sir, I see, sir.

There is a softer explosion.

The Court: You are not trying this case before a Patent Office tribunal which is composed of technicians.

Mr. Osann: I appreciate that, Your Honor.

The Court: One of the things that technical people have
to learn, and which unfortunately they do not know
52 how to do, is to explain their ideas in plain non-
technical English so that any educated person will
understand it.

Mr. Osann: I think that is a point well taken, Your Honor.

The Court: Suppose you were explaining this to a person who is not a scientist, but a friend of yours, whom you had home to dinner and you were explaining it to him. You would not use these technical terms.

The Witness: All right, sir.

Well, there is an explosion that occurs inside of here. It is a very soft explosion, and it is not a shock which is like a rapid knock, but because of these porous elements or discs in the end caps, the explosion is permitted to seep out and act as a cushion effect before it can have this sharp report that is normally encountered in an enclosure that is totally enclosed and without these discs, which are permitted to disappear into the room in which it is mounted, which will take up some of the shock.

By the Court:

Q. Well, what cushions the force of the explosion? You used the word soft. I would say less forceful. A. Less forceful; yes, sir.

Q. Well, what causes that? A. Well, you mean——

53 Q. Is it the discs? A. Yes, sir, it is because of these discs that are in here.

Q. I see. You mean the discs cushion the explosion? A. They permit the explosion to, or permit the force of the explosion to be distributed rapidly to the outside atmosphere, instead of confining it inside of a solid wall enclosure.

Q. Now, then, why a porous metal cap instead of just an opening? A. Well, sir, because every explosion is combustion. It is accompanied by means of flame or spark. That flame is hot enough to ignite the explosive mixture.

Q. Will you answer my question directly, head on?

Why do you use a cap of porous metal instead of just leaving an opening if what you want is to cushion the force of the explosion? A. It is to prevent the explosion of the surrounding atmosphere.

Q. I beg your pardon? A. It is to prevent an explosion of the surrounding atmosphere. It must be closed up by some means from the outside area.

54 Q. But there are openings in this mesh and the gases do escape through this mesh? A. Yes, sir, but they are cool enough so that they do not ignite the mixtures.

Q. Well, how are they cooled? What is what I want to know. A. Well, there are thousands, or I wouldn't know how many, of minute little holes, which will pass right through this porous metal. It is as if you had a bucket of golf balls, and you bonded the ends which are adjacent to each other, and you pour a bucket of water into the bucket of golf balls, the water will seep from the top right out the bottom.

This acts the same way, but they are very minute.

Q. Well, just what does it do? A. It cools these gases to the point where it is below the ignition point of the gases.

Q. Well, what I would like to have you tell me briefly is how do the gases become cooled by passing through these apertures? A. Well, sir, the terrific amount of surface area that there is in any metal of a porous nature is sufficient to withdraw a certain amount of the heat of combustion, whereby it is dissipated into the air uniformly and keeps the temperature down.

The Court: I think you have clarified it for me. You may proceed, Mr. Osann.

55 By Mr. Osann:

Q. Mr. Skrydlak, will you demonstrate how gases pass freely through the porous metal which you described a moment ago? A. Well, Your Honor, if you will allow me to light a cigarette for a moment, I think it would illustrate the point very easily, if I just light it for a second. If I might light a cigarette and I may blow the smoke through, I think you can see how easily the gases go through.

The Court: No, no, that is not necessary. I am not going to have that kind of a demonstration.

Mr. Osann: But the point the witness is making, Your Honor, is that smoke——

The Court: Yes, I understand the point. I think he has made it clear.

I suggest your resume the witness stand.

The Witness: Yes, sir.

By Mr. Osann:

Q. Now, Mr. Skrydlak, referring to the report, Plaintiffs' Exhibit 6, what is the maximum explosion pressure that was developed in the fixture, such as Plaintiffs' Exhibit 5?

The Court: Does the report state it?

Mr. Osann: It is tabulated in the report.

56 The Court: Well, then, it speaks for itself

By Mr. Osann:

Q. Mr. Skrydlak, what sort or what type of explosionproof fixture is this fixture, Plaintiffs' Exhibit 5? A. I would say it is of the vented type.

The Court: Repeat your answer.

The Witness: I would call it of the vented explosionproof type lighting fixture.

The Court: Which means what, in ordinary English?

The Witness: One which allows the passage of air in and out of the fixture rather freely as a vent.

The Court: Very well.

The Witness: As a household vent.

The Court: Well, I think we have enough on that, Mr. Osann.

By Mr. Osann:

Q. Mr. Skrydlak, in general as compared with a heavy wall type explosionproof fixture, would you say that the walls of the vented fixture, such as Plaintiffs' Exhibit 5, can be made thinner?

The Court: Mr. Osann, let me call your attention again to the issue. The issue is not whether the applicant's is a good device, satisfactory to the purchaser, but the issue is whether it is anticipated by the Keil patent. So I am going to assume arguendo that the device is a good
57 device. All that I have to decide, as I see it, is
whether it is anticipated by the Keil patent, and the other patents, and that Keil patent is the principal one.

Mr. Osann: Yes, sir, but my thought is, Your Honor, that one of the factors which Your Honor would conceivably consider in deciding whether or not is anticipated would be whether there are some advantages and improvements in construction, differing from what was in the prior art that had gone before.

The Court: Well, very well.

Mr. Osann: Can we have the previous question read?

The Court: You may read the question, Mr. Reporter.

(The question was read by the reporter.)

The Witness: Would or could?

By Mr. Osann:

Q. I meant could. A. Well, they could be made thinner because of the fact that the pressure inside is of, or an explosion is much softer, and the pressure would be lower than would be encountered in a fixture of the heavy wall construction.

Q. Mr. Skrydlak, I hand you a copy of Plaintiffs' Exhibit 2, a binder of references cited by the Patent Office in application Serial No. 789,444, and ask you if you have reach each of the references contained therein. A. I have read them.

58 Mr. Osann: I have a series of charts, Your Honor, which represent an enlarged version of the patent drawings of each of these references. I would like to have them marked for identification and I would like to offer them in evidence.

The Court: Well, offer them in evidence. Do not let us do two things when you can do one, when one is all that is necessary.

Mr. Osann: I would like to offer them.

The Court: They may be admitted.

Mr. Osann: Plaintiffs' Exhibits 7-A through 7-H, inclusive.

(The documents were received in evidence and marked Plaintiffs' Exhibits 7-A through 7-H, inclusive.)

The Court: I think if you are going to have the witness testify about them, you better do the same thing as you did with the other drawings and have the witness step to the blackboard.

Mr. Osann: Yes, sir, we will do that.

The Court: Mark them as one exhibit. You don't have to give them separate marks.

Proceed, Mr. Osann.

By Mr. Osann:

Q. Mr. Skrydlak, will you step to the board,
59 please? A. Yes, sir.

Q. Using these charts, which are enlarged versions of the patent drawings in Bissell, et al., reference patent 2,476,352, will you explain the device there shown, please? A. This is an electrical lighting fixture——

The Court: You will have to speak louder. You are so far away from the reporter.

The Witness: Yes, sir. This is an explosionproof heavy wall type of lighting fixture utilizing fluorescent tubes for illumination, consisting of one casing housing the ballast, or a transformer as it is called, for the electric circuit, being housed in this casing, provided with caps and aperture openings at each end, for removal when you require access into those openings.

This cap in turn is secured by means of thread engagements with a coupling inserted there between.

The Court: Well, suppose you direct the witness' attention to the distinguishing features.

Mr. Osann: Yes, sir.

By Mr. Osann:

Q. Mr. Skrydlak, the fixture shown in the Bissell patent is a heavy wall explosionproof lighting fixture? A. That is right.

Q. Is there anything in the disclosure of the Bis-
60 sell patent, No. 2,476,352, showing or suggesting a
porous metallic element as part of the wall of that fixture? A. No, sir, nothing shown on the disclosure of this patent.

Q. I next call your attention to a chart showing drawings of the Tornblom reference patent, No. 2,392,202, and will you tell me what type of fixture is shown therein? A. This is also a heavy wall explosionproof lighting fixture.

Q. Do you find anything in the Tornblom patent, 2,392,202 concerning the use of a porous metallic element in the wall of that fixture? A. No, sir.

Q. Does the Tornblom patent 2,392,202 show an explosionproof lighting fixture with an inside chamber? A. What do you mean by an inside chamber?

There is one chamber here between the lamps, extending from one end to the other, which is isolated from the ballast housing at this point, by means of a plug made of insulating material, to confine the explosion to one chamber or the other.

Q. Well, if you got an explosion in either one of those chambers of the Tornblom patent, how would the device there shown deal with it? A. Well, the explosion
61 would be confined within either one of the chambers,
either the lamp chamber which consists of these castings and the lamp assembly, or if it ignites in the chamber housing the terminals, it would be confined between these two ends catsings, one shown here and the other would be at the other end, and the ballast housing, which is connected by a piece of conduit.

Q. Are there access caps shown in the Tornblom patent? A. Yes, there are access caps at the lower end of the casting and at the upper end of the casting which are isolated.

Q. And are those access caps completely solid impervious metallic construction? A. They are.

Q. Mr. Skrydlak, I call your attention to the Williams patent, No. 321,166, and using the enlarged photostatic chart of the drawings of that patent, will you explain the construction of the device there shown? A. This device is a modification of what is commonly known as a Davy lamp used in the mining industry for illumination purposes in the mine.

It consists of a framework made of metal, consisting of a base, a lower ring with which the bass is secured, and an intermediate ring and an upper ring, all secured by means of rods in the usual manner as customarily used.

There is provided in the base a wick, which may
62 be adjusted, lifted or lowered, by means of a wick lifter. This wick is enclosed by means of a wire gauze or wire screen envelope, cylindrical in shape, which is secured in place by means of the flanges of the wire gauze being secured between the base and the rings, which will hold it in place. This envelope has a wire gauze across the top of the envelope as well as along the side.

There is a sleeve, represented here by D, which is also secured between your cap and your upper ring, which is cylindrical in shape, and extends down in relation to the cylinder for a short distance below the wire gauze.

Also provided is a cylinder of metal in between the outer sleeve D and the wire gauze E, which is called an extinguisher, which may be raised or lowered, depending on whether you want to allow the gases to pass over the flame or you want to extinguish the flame. By lowering it, you extinguish the wick flame, making your light inoperative.

Mr. Osann: I have a Davy safety lamp which I would like to offer in evidence as Plaintiffs' Exhibit 8.

The Court: It may be admitted.

(The object was received in evidence and marked Plaintiffs' Exhibit No. 8.)

By the Court:

63 Q. Where is the wire gauze? A. It is inside, sir, your outer metallic cylinder, above the glass. It is not visible unless you remove the parts.

By Mr. Osann:

Q. Mr. Skrydlak, I hand you this lamp, Plaintiffs' Exhibit 8, and ask you if this is representative of the type of lamp shown in Williams patent No. 321,166? A. It is representative of it, though an improvement of it.

Q. And does this lamp have a wire gauze element similar to that shown in the Williams patent? A. It does.

Q. Will you show us what the wire gauze element looks like? A. Yes, sir.

Q. Will you hand it up to the Clerk? A. It is cone shaped, cylindrical, having a flange at the bottom for attachment.

Q. Mr. Skrydlak, will you explain very briefly the operation of the device of the Williams patent, No. 321,166? A. As I mentioned before, this lamp is primarily used in the mining industry, and the coal mining industry, for illuminating the mine shaft for the workers therein.

Before entering the mine, the wick is ignited, and
64 while lit it is brought into the mine where hazardous
gases or vapors may be present to provide illumination for the miners.

Well, if there are gases or vapors present in the mine, they will pass through the screen and be consumed very gradually by the wick, which is ignited at the time.

Q. What is the reason that the Davy lamp is carried into a hazardous area with explosive mixtures of gas present does not cause an explosion? A. Would you repeat that, please, sir? I kind of got lost.

The Court: What is your answer?

The Witness: I am sorry sir, I didn't hear the whole question.

Mr. Osann: Let me restate the question more concisely, Your Honor.

By Mr. Osann:

Q. If you carry a lighted Davy safety lamp into an area where ther are explosive mixtures of gas, why is it that the Davy safety lamp will not cause an explosion? A. Because, as I mentioned before, if it is brought in while it is lit, the gases will pass through the screen and will be consumed by the flame at the wick, and the wire screen at that
time is sufficiently broad and having enough metal
65 and mesh of sufficient size to cool the flame and pre-
vent the ignition of the explosion mixture in the area.

By The Court:

Q. Well, does the wire screen of this Wiliams patent—you refer to it as the Davy lamp. That is the Wiliams patent? A. Yes, sir.

Q. Does the wire screen permit the escape of gases in case there is an explosion in the lamp? A. No, sir, it would not. If there was an explosion in the lamp, it would not prevent the flame or any combustion from leaving the wire gauze and igniting the mixture.

Q. Would it permit the gases caused by the explosion to escape? A. It would, sir.

Q. And would those gases become cooled while passing through the wire mesh? A. To some degree they will be cooled because of contact with metal.

By Mr. Osann:

Q. Would they be cooled sufficiently, Mr. Skrydlak, to prevent an explosion in the surrounding atmosphere? A. No, sir.

The Court: Very well. You may proceed.

Mr. Osann: Your Honor, I have a photostat of two
66 pages from Ganot's physics book dealing with the
operation of the Davy lamp, and I offer that in evidence as Plaintiffs' Exhibit 9.

The Court: Show it to Mr. Cochran.

Any objection?

Mr. Cochran: No objection.

The Court: It may be admitted.

(The document was received in evidence and marked Plaintiffs' Exhibit No. 9.)

By Mr. Osann:

Q. Mr. Skrydlak, is there anything in Plaintiffs' Exhibit 9 concerning the operation of a Davy lamp which supports your statement that the wire gauze of the Davy lamp would not prevent an explosion on the outside of the lamp if you have an explosion inside it? A. I am assuming this is Exhibit 9. I forgot which number it had.

Q. Yes, sir. A. Yes, there is a statement in here which I recall reading.

The Court: Well, now, what is the purpose of this exhibit? Is it to show the state of the art because opinions in a printed book are not admissible as such. A publication is only admissible to show the state of the prior art.

67 Mr. Osann: That is correct, but it is admissible also to illustrate an expert's testimony, Your Honor. This man is an expert in the explosionproof field and this is part of the literature.

The Court: What you are doing is cross examining your own witness. I am going to exclude that question. The exhibit speaks for itself and you can refer to it in your oral argument.

Mr. Osann: Very well, Your Honor.

The Court: The witness cannot make an argument. They are testifying under oath and you should not ask them to make an argument for you.

Mr. Osann: I understand Your Honor.

The Court: You may proceed.

By Mr. Osann:

Q. Mr. Skrydlak, if the lamp shown in Williams patent 321,166 were filled with an explosive mixture and were put into a room or chamber also filled with an explosive mixture and a spark were to occur in the inside of the lamp, inside the wire gauze, what in your opinion would occur. A. That explosion would occur inside of the screened area with such force, in my opinion, that it would be forced out of the screened area and ignite the surrounding mixture because of the sudden shock and force of the explosion.

68 Q. Mr. Skrydlak, would you say that the terms wire screen, wire gauze, and wire mesh fairly describe the screened element of the lamp of Williams' patent

321,166? A. I would. I think either one of those terms would be representative of the material.

Q. Mr. Skrydlak, would you say that the term rigid porous metal element would describe the screened element of the Williams patent No. 321,166? A. No, sir. A rigid porous element as I have encountered in the field, in explosionproof devices, is a different idea than wire gauze or screen. They are entirely different materials and substances.

Q. Mr. Skyrdlak, calling your attention now to Keil patent No. 489,150, using the chart of the drawings of that patent, will you explain the device shown there, please? A. Well, this is what I would call an electrofied version of the Davy lamp or the Wiliams patent. Instead of using a wick, which is kept ignited by a fuel, a liquid fuel, they use an electrical lamp bulb, which is connected to a socket, which is encased in a gauze or wire cylinder held together by the framework of the assembly, which constitutes the invention.

Q. Mr. Skrydlak, if the lamp shown in Keil patent No. 489,150 were placed inside of a chamber filled with an
69 explosive mixture of gases, and those gases permitted to penetrate inside the wire screen element of the Keil device, what in your opinion would happen if that bulb were to break? A. If that bulb were to break, the heat of the filament would be sufficient to ignite the explosive mixture within the wire screen area and would result in an explosion of sufficient force and velocity to force the flame resulting from the explosion outside of the screen and ignite the explosive mixtures surrounding the lamp.

By The Court:

Q. I would like to ask the witness this question: Why doesn't the wire gauze cylinder in the Williams patent and the wire screen or gauze in the Keil patent perform the same function with the same result as the porous metal element in the application for the patent in suit, or the application in suit? A. Well, one can see the wire is

dimension-wise very thin. It has a mesh size, a porosity of so many holes to the inch, and a flame or spark of an explosion is of such force that a flame resulting therefrom, with all this push behind it, is enough to push the flame or spark outside of the screen of this thin dimension; whereas in a porous element or disc of rigid metal, there are so many minute little holes that it has a tendency to
70 choke the flame in one degree, and there is so much metallic area that is present there to dissipate the heat that the flame cannot leave the chamber.

Q. Well, just what is the distinction between the wire gauze and the wire screen of the Williams and Keil patents and the porous element of the applicant's? Just what is the distinction? A. Well, the size of the holes and the overall thickness of the passage, the length of the passages.

Q. In other words, your porous structure thicker and has different sized holes than those of the Williams and the Keil patent; is that correct? A. Yes, sir, and also the fact that in your porous rigid metal, your holes are not straight and continuous through the device. It makes a sort of a zig-zag affair.

Q. Well, is there anything in the claims covering that zig-zag idea? I haven't noticed it if there is.

Mr. Osann: Your Honor, I think the characterization rigid sintered metallic panel produces that characterization.

The Court: What do you claim the word "sintered" means?

Mr. Osann: Sintered metal is known among metallurgists as constructed of a lot of small particles which have been bonded together at the point where they touch, and I think connotes this so-called zig-zag effect that the
71 witness mentioned.

The Court: I don't see any connection of that with the zig-zag effect.

Mr. Osann: He is talking of of the paths through such a metallic body, and that the paths through would have to be the spaces between the little particles across the thickness of metal.

The Court: Very well. You may proceed.

By Mr. Osann:

Q. Mr. Skrydlak, as an electrical fixture for use in explosive atmospheres is the device of the Keil patent No. 489,150 safe in your opinion? A. No, not safe at all.

Q. Mr. Skrydlak, I next call your attention to the British patent to Gover, N. 23,369, and using the chart of the patent drawings, will you explain the device there shown, please? A. Well, this is a fuse simply consisting of a base and a body, which is cylindrical, having, I believe, it is two layers of wire gauze or screen, which are bonded to the top of the open end of the cylinder, and the fuse assembly is secured to the top of the base inside the shell to encase it therein.

Q. What is the element W at the top of the device? A.
Well, W represents wire gauze or wire screen, very
72 similar to that used in Williams and Keil.

This part here, Your Honor, represents wire gauze which is disclosed in the patent.

Q. Does that wire gauze have any rigidity? A. Well, about as rigid as your wire screen is on your household screening.

Q. Would it be possible or easy to poke a screwdriver through it? A. Very easy.

Q. Do you find anything in the Gover patent concerning a rigid porous metallic panel? A. No, sir.

Q. Suppose the device of the Gover patent were filled with an explosive mixture, gases, and the device then put in a chamber also filled with explosive gases, then assume a spark takes place inside the Gover device, what in your opinion would happen? A. Well, in my opinion, the same thing would happen as I mentioned in Williams and Keil, the force of the explosion inside the enclosure here would force the flame or resulting spark or hot gases outside of the wire screen area and ignite the mixture because the wire screen would not be sufficient to cool the hot gases below the ignition point of the gases, or would not have a sufficient path between the mesh to restrict the flame within the enclosure.

73 Would the Gover reference in your opinion be safe to use in a hazardous location? A. No, sir, I don't think so.

Q. Does the Gover reference have anything to do with lighting fixtures? A. No, sir.

Q. Now, Mr. Skrydlak, I call your attention to Baker patent 2,447,048, and using the enlarged photostat of the patent drawings, will you describe the device there shown? A. Well, this is called or what is known as a flashback arrester used in welding apparatus. It is provided between the torch end of the welder and the gas lines from the cylinders which would feed the mixture needed for its burning.

It consists of a rigid metal upper cover and a body secured together by means of bolts or cap screws and clamped rigidly together. Each of these portions of the cover and body are respectively provided with a coupling for attachment to the torch or the gas line at the other end.

There is a clamp between these parts, No. 17 and 18, a ring in which is inserted a porous disc. This disc in turn is provided with a center ring of solid metal which is press fitted into place before assembling into the flash-back arrester, so that in the event of a flash-back or backfire at the torch end, the resulting flame of ignition will be
74 brought back into this chamber, will strike the deflector, that solid metal piece, and deflect the gases over to the entire area of the porous disc, will cool the gases sufficiently so that they will not ignite the remaining gases which are in this opening leading from the gas lines.

Q. Mr. Skrydlak, which end of the Baker device is connected to the torch of the welding outfit? A. This end here (indicating).

Q. And by which you mean the right-hand end as shown in the patent drawing? A. That is right; on which the arrow is.

Q. And if you get what is called a flash-back at the welding torch, what happens in the setup of the Baker patent? A. As I mentioned your flame will at the backfire— there will be a flame which will cause the flame to carry back along the line to this cover, along this line, which is an opening in the flash-back arrester, and it will strike this deflector, which is a solid metal in the porous disc, and it will deflect the gases or flame of the backfire, so that it will have a large area in which the heat may be cooled sufficiently so that the remaining gases, which are still at the inlet side, leading from the tank, will not be ignited and cause a serious explosion.

Q. Mr. Skrydlak, would a flash-back or backfire
75 produce explosive pressure in the welding line? A.
Oh, I would say it would create an extremely high pressure.

Q. And where would that pressure go? A. It would be forced against the exposed area, along this element, No. 15 and 20 combined.

Q. Would the torch have anything to do with relieving any of that pressure? A. Yes, it would be about the only way it could be relieved because we have a clamping arrangement between No. 17 and 18, such as we have in the heavy wall construction of electrical devices, which would only allow any pressure to dissipate and lower over a long time.

Q. Does the disclosure of the Baker patent 2,447,048 at any place treat or mention explosionproof electrical fixtures? A. No, sir.

Q. Does it at any place treat or mention the problems encountered in explosionproof electrical fixtures? A. No, sir.

By The Court:

Q. Does the Baker structure contain a porous metal element? A. It does, sir, as illustrated in Figures 2, 3 and 4. This is the assembly before it is finally fitted with the center piece, and finally we have——

76 Q. Well, now, which is the porous metal element? What is the number of that? A. It is No. 15, sir.

Q. Very well. What function does it perform in the Baker structure? A. It is the flame arrester, sir. It arrests the flames so that it will not go through and ignite any gases on the other side.

Q. It is porous, not solid? It has openings in it? A. That is right, sir, it has those openings illustrated here, which would be shown by the cross hatching of the drawing.

The Court: Very well. You may proceed.

By Mr. Osann:

Q. Does the metallic element 15 of the Baker patent vent pressure? A. Not in the sense I explained it before. You don't get a soft explosion, as I mention, but you get a very sharp report, a sudden jar, which results in high pressures.

Q. Is the element 15 shown in Figure 4 of the Baker patent differ from the element shown in Figures 2 and 3? A. Is this different from this?

Q. 15 shown in Figure 4? A. Yes.

77 Q. Broadly, what is that difference? A. The only difference is in Figure 2, it shows the disc before the solid metal insert is fitted into the hole, which is made before time in the disc. This shows how the solid metal insert appears before it is pressed into the opening and solidly held therein as illustrated in Figure 4. In other words, it fills the entire opening in the porous disc and spreads out so it is considered integral with the remainder of the disc.

Mr. Osann: Your Honor, I had intended to have the witness testify briefly about certain other references that the Patent Office cited in the prosecution, but in view of Your Honor's comments I don't believe that they are pertinent.

The Court: No, I think you have covered with the witness' testimony the references on which the Board of Appeals of the Patent Office relied.

Mr. Osann: I believe I have, and I would just like to be sure Mr. Cochran agrees with us on that point.

Mr. Cochran: That is correct, Your Honor.

The Court: Well, we will take our usual recess at this point.

(Thereupon a short recess was had.)

The Court: You may proceed.

Mr. Osann: Your Honor, I would like to offer in evidence a chart showing or illustrating certain tests that were run at Underwriters Laboratories.

78 Mr. Cochran: No objection.

The Court: Very well.

(The document was received in evidence and marked Plaintiffs' Exhibit No. 10.)

Mr. Osann: And I would like to offer in evidence two fixtures similar to the fixture, Plaintiffs' Exhibit 5, which were actually tested at that time.

The chart is Plaintiffs' Exhibit 10.

Now, the fixtures will be Plaintiffs' Exhibits 11 and 12.

(The articles were received in evidence and marked Plaintiffs' Exhibits 11 and 12, respectively.)

Mr. Osann: The record should show that Plaintiffs' Exhibit 11 has caps with wire screening, and includes two caps with coarse wire screening and two caps with fine wiring screening.

Mr. Cochran: If Your Honor please, these appear to relate to the tests which the Board referred to and said that they were willing to accept the results of these tests as correct. I don't see how they are pertinent now.

The Court: I am inclined to agree with Mr. Cochran because you are trying to prove something that is conceded.

Mr. Osann: Your Honor, the tests that the Board was talking about in its opinion were certain tests that
79 were run and the results exhibited to the Examiner during the prosecution of the application.

These tests are somewhat broader based and are more accurate.

The Court: Well, when were they conducted?

Mr. Osann: They were conducted January 9, 1957. I have the report here from Underwriters Laboratories.

The Court: Unless there is any objection as to competency, I am going to admit them.

Mr. Cochran: It is irrelevant. I think it is irrelevant.

The Court: They may be admitted. This is not a jury trial, and I am going to admit them.

If it is not relevant, it won't affect the Court's decision.

Mr. Osann: Well, Your Honor, I think it is relevant in that the Patent Office is still relying——

The Court: Well, I am admitting it, Mr. Osann.

Mr. Osann: Yes, sir. The report dated January 9, 1957, from Underwriters Laboratories, I am offering that as Plaintiff's Exhibit 13.

(The document was received in evidence and marked Plaintiffs' Exhibit No. 13.)

By Mr. Osann:

Q. Mr. Skrydlak, did you observe certain explo-
80 sion tests recently conducted at the request of the
Appleton Electric Company by Underwriters Lab-
oratories? A. Yes.

The Court: Well, now, you already put in the report of the test. Isn't that sufficient?

There was no objection raised that the report is not competent.

Mr. Osann: Well, I would like to have the witness explain briefly what was done.

The Court: Well, it is unnecessary if it is all in the report, isn't it?

Mr. Osann: Well, the report does not include this chart, Your Honor. We made the chart up to illustrate it just a little more fully, what the setup was there.

The Court: Well, make it very brief, Mr. Osann. After all, as I pointed out at the opening of the afternoon session, there is a very narrow issue here.

Suppose you confine yourself to it. You may proceed.

By Mr. Osann:

Q. Mr. Skrydlak, will you step over to the blackboard, please?

Now, will you explain what was done in the tests, briefly?

A. Well, one fixture is illustrated by the exhibit
81 with the discs of course metal inserted in the end
casing.

Mr. Osann: That is this fixture, Your Honor, Plaintiffs' Exhibit 12.

The Witness: It was inserted in a wooden box as shown, laying down flat, whereas another fixture with the exact construction, except for the caps, which had wire screen of 20 mesh size inserted therein, was installed in an adjacent wooden box, but each of these boxes had a cover which is hinged as a safety measure, and is also provided with a sheet of cellophane in the top of the cover to permit means for viewing, by means of mirror suspension behind a wall of steel and contract, so that you can observe exactly what is going on inside of these test boxes.

Now, before inserting in these boxes these devices were drilled and tapped with openings for connection of a spark plug for igniting the explosive mixture, inlets, connections into each end of the lamp and into the box.

An explosive mixture, which was specially prepared in a known concentration by a carburetor system which was especially designed at Underwriters——

The Court: Mr. Osann, all this is in your report as I read this. Why the duplication?

Mr. Osann: Well, the report uses technical language and I thought perhaps——

82 The Court Well, I can understand it.

As I see it, the sum and substance of the report is that where these porous plates were used, there was no flame and no sparks from this box and no ignition in the surrounding explosive mixture occurred; whereas in the case without these porous plates, this result was not reached. Isn't that what it amounts to?

Mr. Osann: In general, that is correct, Your Honor.

The Court: Well, I think that is all.

Mr. Osann: They covered a wide enough range of explosive mixtures to have——

The Court: Now, don't consume the time of the Court unnecessarily by duplicating matters. When I say the Court's time, it is not the Court's time, it is time belonging to other litigants, because we have a lot of cases to try.

Mr. Osann: I realize you have a heavy docket, Your Honor.

The Court: I would just as leave spend three or four days on this case. It would be easier for me. It is interesting, but I owe it to the other litigants to try to get the case completed.

Mr. Osann: Yes, sir; that is a point well taken, Your Honor.

The Court: Now, suppose you resume the stand.

By Mr. Osann:

83 Q. Mr. Skrydlak, on the basis of these tests, in your opinion, would an electric lighting fixture vented by wire gauze of the type suggested in the Williams, Keil and Gover patents be safe as an explosionproof lighting fixture? A. In my opinion it is not safe, which is corroborated by the——

The Court: Well, just answer yes or no.

The Witness: Yes, sir—I mean, it would not be.

The Court: It would not be safe?

The Witness: It would not be safe.

By Mr. Osann:

Q. Mr. Skrydlak, if the solid closure caps shown in the Tornblom patent, No. 2,392, 202, or in the Bissell, et al., patent were replaced by caps having wire screen or wire gauze of the type shown in the Williams, Keil or Gover references, would the resulting fixture, in your opinion, be safe for use in hazardous areas? A. No; it would be not safe.

The Court: Mr. Osann, the Tornblom patent, of course, is an earlier patent issued to this inventor, to this applicant.

Mr. Osann: It happens to be the same inventor; yes, sir.

The Court: Now, does that show this porous metal element?

84 Mr. Osann: No, sir, it does not. It is a so-called heavy wall type fixture.

The Court: Oh, I see.

By Mr. Osann:

Q. Mr. Skrydlak, what if any opinion do you have concerning the safety of the Keil and Gover device? A. Well, as indicated in these tests wire gauze did not prevent explosion in the surrounding atmosphere from an explosion that was created inside the fixture, therefore, I would consider them unsafe and non-explosionproof.

Q. In your opinion, do the Keil and Gover references suggest to one having ordinary skill in the art that a successful explosionproof lighting fixture might be constructed to include a casing enclosed partially by a solid impervious wall and partially by a rigid pervious wall of porous metal? A. No, sir, they don't suggest it at all.

Q. In your opinion, does the Baker reference suggest to one having ordinary skill in the explosionproof art that a rigid sintered metallic panel of substantial thickness might be employed as part of the wall of a casing for an explosionproof electric light fixture? A. No, sir; not as a lighting fixture.

Q. In your opinion, would it be obvious to one having ordinary skill in the art, having the Baker, Williams, and Tornblom 2,392,202, and Bissell, et al., references be-

85 fore him to make the closure caps of the Bissell, et al., reference out of porous metal? A. No, sir; no disclosure in those patents.

Q. Mr. Skrydlak, do you know of any other explosion-proof lighting fixture of the vented type which existed prior to December 3, 1947, other than the fixture described in Tornblom application, Serial No. 789,444 here? A. No, sir; that was the first one that had been submitted to Underwriters while I was there, to Underwriters Laboratories after my employment there. That is the first time it ever arose.

Mr. Osann: I have a claim comparison binder, Your Honor, which I offer in evidence.

The Court: No, you cannot offer that in evidence. You can submit that to the Court for its information as part of your brief. This is argumentative material. It cannot be offered in evidence.

Mr. Osann: Your Honor, the witness has something to do with the preparation of it, and I was thinking that we could introduce it to illustrate his testimony only.

The Court: The Court will be glad to have it but as part of your brief. This is in the nature of a brief, rather than in the nature of testimony.

Mr. Osann: Well, then Your Honor, it might be necessary to take the witness through each of the claim
86 elements.

The Court: No, it is not. I won't permit that. The Court can read also, you know.

Now, move along. You may proceed.

Mr. Osann: Well, Your Honor, I am going to offer the claim comparison chart for the purpose of illustrating the testimony of the witness.

The Court: Very well, let it be admitted.

You know, I think when the Court indicates a certain procedure that it behooves counsel to cooperate by trying to follow that procedure that the Court indicates.

(The document was received in evidence and marked Plaintiffs' Exhibit No. 14.)

Mr. Osann: Your Honor, I desire to be cooperative.

The Court: You may proceed. This is admitted.

By Mr. Osann:

Q. One further question, Mr. Skrydlak. Does this claim comparison chart, Plaintiffs' Exhibit 14, reflect accurately your opinion on the matters therein shown? A. It does so.

Mr. Osann: Your witness, sir.

Cross Examination

By Mr. Cochran:

Q. Mr. Skrydlak, you testified that the Tornbloom patent
had access caps to provide access to the interior of
87 certain parts of the lamp, did you not? A. That is
right, sir.

Q. Is it your understanding if those access caps were of rigid porous construction that that would in essence meet the invention claimed in the application in issue? A. If it were made of porous metal?

Q. Yes, sir. A. Yes, they would, in my opinion.

The Court: What is that? What are you referring there to there?

Mr. Cochran: I was referring to the access caps, 40.

The Court: In which patent?

Mr. Cochran: In the Tornblom patent.

By Mr. Cochran:

Q. Now, going to the Williams patent, the Examiner in the Patent Office relied more on element G than he did on the screen C of that patent.

Would you explain the function of the element G at the top of the Williams lamp? A. The element G there, according to the disclosure, is a safety cap, which is threaded into the upper ring, held in there by thread engagement, as provided at its lower open end by means of wire gauze, which is similar, I assume, as the gauze used in cylinder C.

88 It is provided there, according to the disclosure, that in the event that the flame does go through the wire screen envelope, it will then be stopped by the additional gauze at the top.

Q. It has the same purpose in general then as the screen 2 at the lower part? A. Yes.

The Court: What is element G?

Mr. Cochran: Element G is the element at the top, Your Honor.

The Court: I see it, but what is it?

Mr. Cochran: That is what I just asked the witness, to describe the operation of it, and he indicated that it had a similar function to this.

The Court: Yes, I know, but what is it?

Mr. Cochran: It is a wire gauze element of the same type as the gauze C and for the same purpose.

It is in paper F, Your Honor.

The Court: I thought that the wire gauze was the element that went up and down the whole structure.

Mr. Cochran: Yes, it is. This is an additional one at the top.

The Court: Very well.

Mr. Cochran: It corresponds more to the type of closure shown in the application.

89 The Court: Very well. You may proceed.

By Mr. Cochran:

Q. Under what condition in the Williams lamp would you have flame attempting to pass through the gauze and being stopped by the gauze? A. Well, if you had a sudden draft in the area, similar to you holding a candle, and you blowing at it, you will see how the flame leans over to one side.

When you have an explosion, you have the same thing but of more extreme violence. It is a whip in a sense of a lot of hot gases and flame, and a tremendous draft which could only be compared by an engineer.

Q. Well, the difference between a flame and an explosion is more or less a matter of degree, is it not? A. Yes, it is a vast difference of degree.

Q. Well, is there any point when you can say that there is an explosion and not a flame? A. Any point? Well, I don't think you can have any sharp line of demarcation.

Q. Yes, sir, that is the point I wanted to make.

Now, it was your testimony, I believe, that those in the art wouldn't usually call the Williams element a rigid porous element? A. That is right; I wouldn't call it that.

90 Q. You would not call it that? A. A rigid porous element.

Q. Well, do you mean by that testimony that it would be entirely inaccurate to call it a rigid porous element? A. Well, I base my opinion on what I consider as rigid.

The Court: I think you can answer counsel's question.

The Witness: I beg your pardon, sir. What is the question?

By Mr. Cochran:

Q. Well, would you say it would be entirely inaccurate to call that element a rigid porous element? A. I would.

Q. And on what do you base that? A. Well, from my my experience as encountered at Underwriters, what is a rigid porous element is——

Q. Well, first take the word. It is porous? A. Well, yes, it is porous.

Q. Well, is it rigid? A. I would say, no.

Q. It is not rigid? A. Not rigid in the explosionproof sense of the word.

Q. Well, now, we are not talking about an explosion, we are talking about whether or not this is a rigid porous element. You stated in your testimony, I believe, that it has as much rigidity as a screen at home.
91 That would indicate that rigidity is a matter of degree, would it not? A. It is.

Q. And this has rigidity to some extent the, doesn't it?

The Court: Of course, the Board ruled that the word "rigid" is sufficient to cover wire gauze.

Mr. Cochran: Yes, sir. Well, I was wondering if the witness didn't agree with that. It turns out that he does.

By Mr. Cochran:

Q. Now, going to the Gover patent, I believe it was your testimony that the wire screens there would be insufficient, have insufficient flame arresting property to prevent an explosion? A. That is right.

Q. Well, that was not Gover's intention, was it? He wanted to prevent an explosion? Wasn't that his purpose? A. Well, his purpose, the way I gather from the disclosure, he was making it explosionproof. An explosion would occur inside of the enclosure because of the shorting out or the blowing of the fuse element, which created a hot enough spark to ignite the mixture inside of the enclosure and prevent the propagation of the flame or spark resulting from the explosion or the hot gases from igniting the surrounding mixture.

92 Q. That was his purpose? A. That was his purpose.

Q. Would it be effective for that purpose? A. No, sir. As observed at the tests I witnessed, the wire screen which was comparable, I believe the wire screen used here, would not prevent an explosion outside of the area.

Q. Now, going to the Baker patent, is it your understanding that the flame arresting disc there is made of the same material as the porous metal disc claimed in the application in issue? A. Yes; that is my understanding.

Q. And if that were used as a flame arresting member in the Tornblom patent, you would have anticipation of the application in issue; is that right? A. Anticipation in that sense of the word, yes.

Q. Now, your testimony as to Baker was, as I remember it, and you correct me if I am wrong that it did not treat the problems of explosionproof electric lamps? A. That is true.

Q. Well, now, considering it from this angle, the problem treated by Baker was the same as that treated in the application in some respects, is it not?

Now, I recount some of them that might apply. First is that the trouble that Baker attempted to solve——

The Court: Don't argue with the witness. Just ask him a question.

93 Mr. Cochran: Yes, sir.

The Court: Make your oral argument to the Court when both sides rest.

By Mr. Cochran:

Q. Would you agree that the trouble that Baker attempts to solve is the fact that you are dealing with an explosive gas, first of all? A. Yes.

Q. And you have associated with that explosive gas conditions in which an explosion or spark might take place? A. Yes.

Q. And you have a flame arrester between the explosive gas and the conditions which might cause explosion? A. Would you mind repeating that?

Q. You have a flame arrester between the explosive gas and the possible explosive conditions? A. Yes. I see what you mean now.

Q. Then it would be fair, wouldn't it, to say that Baker would suggest that a sintered metal disc would be effective as a flame barrier between an explosive atmosphere and a device in which an explosion may take place? A. As a barrier between what?

Q. An explosive atmosphere and a device in which an explosion may take place. A. Yes, it could be used as a barrier.

Mr. Cochran: That is all.

94 The Court: Is there anything further?

Mr. Osann: Just a few questions, Your Honor.

Redirect Examination

By Mr. Osann:

Q. Mr. Skrydlak, referring to the Williams patent, 321,166, and the element G shown therein—— A. Yes.

Q. What is the purpose of the element G? A. Oh, the element G is supposed to provide one portion of the enclosing wall as explosionproof, to prevent the propagation of flame or spark resulting from an internal explosion from igniting the mixture outside of the device.

Q. What does the specification of Williams say about element G?

The Court: Well, the specification speaks for itself. You can call attention to it in oral argument if you want to.

The Witness: Well, it gives additional safety——

The Court: No.

The Witness: I am sorry, sir.

By Mr. Osann:

Q. Mr. Skrydlak, getting back to the——

The Court: Well, now, I will ask counsel to point out to the Court wherein that patent this element is dealt with.

95 Mr. Osann: Your Honor, the element G is dealt with on the back page of the patent, the left-hand column, starting at line 11.

The Court: I see it.

Mr. Osann: And running to the end of that paragraph.

The Court: Thank you.

By Mr. Osann:

Q. Mr. Skrydlak, getting back to the term rigid, as you understand this term in the sense of the Tornblom application, Serial 789,444, does the term rigid include a wire screen or wire gauze? A. It does not.

Q. Mr. Skrydlak, in the Baker patent, the porous metal element 15 shown therein—do you have it before you? A. Yes, I do.

Q. Does that element have an explosive mixture on just one side of it or on two sides of it?

The Court: It is hard for me to follow you when you turn around.

Mr. Osann: I am sorry, Your Honor.

The Witness: It has explosive gases on each side of it. I would say, it is totally enclosed inside of the enclosure, as if you put a porous element in between your chambers inside of your fixture.

By Mr. Osann:

96 Q. Does the element 15 of Baker serve as a pressure venting means? A. Not in the sense we have described here in court today; no.

Q. What happens to the pressure in the device of Baker on the torch side of the device? A. Well, on the torch side, the pressure after building up inside of the casing would have to be relieved by either going through the screen, and then through a clamping fit between the other parts, No. 17 and 18, as in the heavy wall construction devices; or it could be relieved out of the torch end by blowing back in the opposite direction that the explosion had occurred.

Q. The welding torch is open ended? A. Yes, sir, it is open ended. It is belt operated or actuated.

Mr. Osann: That is all, Your Honor.

Mr. Cochran: I have one question, Your Honor.

Recross Examination

By Mr. Cochran:

Q. When the application lamp is mounted in an explosive atmosphere, do you have an explosive atmosphere then on both sides of the porous barrier? A. If it is mounted inside of an explosive atmosphere; yes.

Mr. Cochran: That is all.

97 The Court: Step down.

(Thereupon the witness was excused.)

Mr. Osann: I have another witness, Your Honor.

The Court: The plaintiff rests?

Mr. Osann: I have another witness, Your Honor.

The Court: Oh. What on?

Mr. Osann: On the engineering aspects of this explosionproof lighting fixture. The witness is prepared to show broadly the nature of the heavy wall fixture, which was one of the predecessors to this device, and then to contrast that with certain other fixtures.

The Court: Well, how is that useful in view of the issues of this case? In other words, I am going to assume arguendo that this device here in suit is a valuable inventive step, provided it is not anticipated by the prior art on which the Board of Examiners relied.

Mr. Osann: Well, I appreciate that, Your Honor, but one of the difficulties that we all get into in deciding what is or is not an inventive step is measuring the advance that the thing makes in the art, and I would like very much to do that.

The Court: Well, make his testimony very brief.

Mr. Osann: Yes, sir.

The Court: Put him on.

Mr. Osann: Mr. Carl H. Lindell, take the stand, please.

98 Thereupon,

Carl H. Lindell

was called as a witness by the plaintiffs and, being first duly sworn, was examined and testified as follows:

Direct Examination

By Mr. Osann:

Q. State your name and address, please. A. My name is Carl H. Lindell, L-i-n-d-e-l-l.

I reside at 5849 North Maplewood Avenue, Chicago 45, Illinois

Q. What is your present employment? A. Chief Engineer of the explosionproof fittings and industrial lighting divisions of the Appleton Electric Company.

Q. How long have you been with the Appleton Electric Company in this sort of work? A. I have been chief division engineer of Appleton Electric Company since 1955, June of that year.

Q. What did you do before that at Appleton Electric Company, if anything? A. I was development engineer for Appleton Electric Company since 1950 to 1955.

Q. What did you work on as development engineer during that time? A. During that time it was my responsibility to design and develop explosionproof lighting fixtures.

99 The Court: I think you have qualified him sufficiently, Mr. Osann.

By Mr. Osann:

Q. Mr. Lindell, you are familiar with the specifications and claims——

The Court: I assume he is. Now, let us omit the preliminaries. You would not have him here if he wasn't familiar.

By Mr. Osann:

Q. Mr. Lindell, we have had testimony about the fixture, Plaintiffs' Exhibit 5 as representing a vented explosionproof lighting fixture made by Appleton Electric Company.

Does Appleton Electric Company make other types or kinds of vented explosionproof lighting fixtures? A. Yes, we manufacture an incandescent type of explosionproof lighting fixture called our AA51, vented series.

The Court: Well, gentlemen, I regret that we will have to recess for today at this time because I have to attend a court ceremony in a very few minutes.

We will resume this case tomorrow morning at 10 o'clock.

I take it that this witness' testimony will conclude your presentation?

Mr. Osann: I will have two more witnesses, Your Honor, who will testify quite briefly, one as to commercial acceptance.

100 The Court: Well, cannot this witness give you that?

Mr. Osann: Conceivably he could. I have a better qualified witness, though.

The Court: What will the other witness' testimony be about?

Mr. Osann: The other will testify about certain aspects of the Baker patent.

The Court: No, I won't hear two experts on the same point. You have had Mr. Skyrdlak on the Baker patent.

Mr. Osann: Your Honor, this will be a fact witness. He is connected with the company that had the Baker patent.

The Court: How long will his testimony take?

Mr. Osann: A matter of five minutes.

The Court: Very well.

Are you going to have any testimony? I presume not.

Mr. Cochran: We will not, Your Honor.

The Court: Then I will be very glad, if you gentlemen decide to do so, to hear brief oral argument at the conclusion of the case.

Mr. Osann: Your Honor, I will, of course, be glad to present one if you prefer it.

The Court: I don't request it, but I will give you an opportunity to make one.

Mr. Osann: And would we also have an opportunity
101 to submit the case on briefs?

The Court: No; I don't take briefs after trials. As a matter of fact, that is why I prefer oral argument. I decide cases while they are fresh in my mind and I don't take briefs after the trial is finished.

Mr. Osann: Well, is it permissible to submit proposed findings of fact and conclusion of law?

The Court: I will give you an opportunity for that later on.

Mr. Osann: Yes, sir. After we have the benefit of the record and so on?

The Court: Yes.

(Thereupon, at 3:45 o'clock p. m., an adjournment was taken until 10:00 o'clock a. m., on Tuesday, January 29, 1957.)

* * * * * * * * * *

102 Washington, D. C.,
Tuesday, January 29, 1957.

Pursuant to adjournment theretofore taken, the trial of the above-entitled case was resumed at 10:00 o'clock a. m., on Tuesday, January 29, 1957, in the United States District Court for the District of Columbia, in the Court House, at Washington, D. C.

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103 PROCEEDINGS

The Court: Proceed with the case on trial.

You may proceed, Mr. Osann.

Mr. Osann: Thank you, Your Honor.

I have in my hand a small reproduction of Plaintiffs' Exhibit 10, which was a large chart that we put in evidence yesterday, and I would like to hand up for Your Honor's convenience, particularly with reference to the report, Plaintiffs' Exhibit 13.

The Court: I am sure it will be very helpful.

Mr. Osann: I would like to call Mr. Carl H. Lindell to resume the stand, please.

Thereupon,

Carl H. Lindell

resumed the witness stand pursuant to the adjournment and testified further as follows:

Mr. Osann: Your Honor, may I have the last question read?

The Court: Oh, no, it would be difficult to locate it. So much has gone on between.

Direct Examination (Resumed)

By Mr. Osann:

Q. Mr. Lindell, do the vented explosionproof lighting fixtures manufactured and sold by Appleton Electric Company come in various sizes? A. Yes, they do. They
104 come in 100 watts, 200 watts, 300 watt, medium base, and 300 and 500 watt mobile base lamp size.

The Court: Are you referring to the fixture covered by the patent or by the application?

The Witness: Yes, sir.

Mr. Osann: Yes, sir; there is a family of fixtures covered by the application.

The Court: Yes. Well, I wanted to make sure that you were not covering all fixtures of that kind. It is those covered by the application?

Mr. Osann: Yes, sir. That is what the question and answer are directed to, Your Honor.

By Mr. Osann:

Q. And this series of fixtures that you just described is known as the AA51 series? A. Yes, sir.

Q. And you have final responsibility for the design of the AA51 series of vented explosionproof lighting fixtures? A. I do, sir.

Mr. Osann: Your Honor, I would like to offer in evidence as Plaintiffs' Exhibits 15 and 16 two sample vented explosionproof lighting fixtures of the type identified by the witness, the fixtures being identified by their name plates as Series AA51, fixtures rated for 200 to 300 watts, and for 300 to 500 watts, respectively.

The Court: They will be admitted.

105 (The objects were received in evidence and marked Plaintiffs' Exhibits 15 and 16.)

The Court: You may proceed.

Mr. Osann: I would like to offer in evidence as Plaintiffs' Exhibits 17 and 18 two prints of Appleton Electric Company engineer drawings, Nos. 64039 and 64029, respectively, these being sectional views of the two sample fixtures just introduced as Exhibits 15 and 16.

The Court: Show them to Mr. Cochran.

Mr. Cochran: No objection.

The Court: They may be admitted.

(The documents were received in evidence and marked Plaintiffs' Exhibits 17 and 18.)

Mr. Osann: I have duplicate copies for Your Honor's convenience, if you so desire.

The Court: Very well. Thank you. You may proceed.

Mr. Osann: I offer in evidence as Plaintiffs' Exhibit 19 a sample incandescent fixture of the heavy wall explosionproof type previously manufactured by the Appleton Electric Company as the predecessor of the vented type fixtures, exemplified by Exhibits 15 and 16.

The Court: Well, now, which is 15 and 16? Hold them up, would you mind?

I see. Very well.

106 Mr. Cochran: No objection.

The Court: It may be admitted.

(The object was received in evidence and marked Plaintiffs' Exhibit No. 19.)

Mr. Osann: I offer in evidence as Plaintiffs' Exhibits 20 and 21, two prints of Appleton Electric Company engineering drawings, No. 53,350 and 55,140, respectively, which are partial sectional views of the heavy wall explosionproof lighting fixture, such as Exhibit 19.

Mr. Cochran: No objection, Your Honor.

The Court: They may be admitted.

(The documents were received in evidence and marked Plaintiffs' Exhibits Nos. 20 and 21.)

Mr. Osann: I would like to hand up duplicate copies for Your Honor's convenience.

The Court: Very well. You may proceed.

By Mr. Osann:

Q. Mr. Lindell, calling your attention to the drawings, Plaintiffs' Exhibits 17 and 18, will you identify by the coloring thereon, the glass, the solid metal, and the porous metal portions of the fixture casings, if such portions are present?

May I have the originals of 17 and 18?

The Court: Will you repeat your question?

By Mr. Osann:

107 Q. Yes, sir. Calling your attention to the drawings, Plaintiffs' Exhibits 17 and 18, will you identify by the colors thereon, the glass, the solid metal, and the porous metal portions of the fixture casings, if such portions are present?

The Court: Do it briefly.

The Witness: Yes, they are. The blue portion signifies the glass globe, and the yellow coloring the vented portion or porous metal.

The Court: Which is the porous one?

The Witness: The yellow, sir, Your Honor, and that is on drawing 64,029.

The Court: Very well.

The Witness: And the aluminum housing portion by the pink color.

Referring to drawing 64,039, Your Honor, the blue again depicts the glass globe, and the yelllow the vented or porous portion, and the red and purple coloring the aluminum housing that encloses the vented portion.

By Mr. Osann:

Q. Mr. Lindell, calling your attention to the drawings, Exhibits 20 and 21, will you identify by the coloring thereon the glass and the solid metal portions of the fixture casing, if such portions are present?

The Court: Are they the same as in the other 108 drawing?

The Witness: Approximately, Your Honor.

The Court: Then you don't have to repeat it.

By Mr. Osann:

Q. Is there any porous metal portion in the fixture wall there shown? A. No, sir; on these fixtures there are no vented portions.

Q. Mr. Lindell, calling your attention to the physical sample fixture, Plaintiffs' Exhibit 15, will you indicate, please, the porous metal wall panel in the fixture casing, if such is present? A. The cylindrical portion represents the porous portion of this fixture.

The Court: I don't think we need any more details as to the invention or its embodiments.

Anything further of this witness?

Mr. Osann: Yes, sir, I have, Your Honor.

The Court: Well, let us proceed more expeditiously.

Mr. Osann: I will, Your Honor.

The Court: Do not let us overtry the case.

By Mr. Osann:

Q. Mr. Lindell, the designs and constructions of all three sample fixtures, Plaintiffs' Exhibits 15, 16 and 19, were given explosion tests and granted approved 109 listing by Underwriters Laboratories before they were marketed?

The Court: Now, please don't make a statement. You may ask a question.

Mr. Osann: Yes, sir. I will rephrase the question, Your Honor.

By Mr. Osann:

Q. Were the designs and constructions of all three sample fixtures, Plaintiffs' Exhibits 15, 16 and 19, given explosion tests and granted approval by Underwriters Laboratories?

The Court: I am going to exclude that because we have had that once, that they were approved, and you have that in the report. Now, please do not let us have any accumulative evidence on matters that are not in dispute. You are just wasting the Court's time.

By Mr. Osann:

Q. Mr. Lindell, what maximum explosion pressure have you encountered within the 200 heavy wall fixture shown in the drawing, Exhibit 20, and exemplified here by Exhibit 19? A. In that fixture?

The Court: Just answer the question.

The Witness: Yes, Your Honor.

Eighty pounds to the square inch as the maximum explosion pressure.

By Mr. Osann:

110 Q. What maximum explosion pressure have you encountered within the 300 watt vented fixture shown in drawing, Exhibit 17, and exemplified by Exhibit 16? A. That is the 500 watt, Mr. Osann?

Q. Exhibit 16 is the 500 watt, yes. A. In that unit it was one and a half pounds to the square inch.

Q. What maximum explosion pressure have you encountered within the 500 watt heavy wall fixture shown in the drawing, Plaintiffs' Exhibit 21? A. 96 pounds to the square inch.

Q. In two explosionproof fixtures of the same wattage, if one is vented by a porous metal wall panel and the other is of the so-called heavy wall type, do the walls of the vented fixture withstand more or less pressures than the walls of the heavy wall type? A. The vented type, naturally, would withstand less pressure, as has been testified, sir.

The Court: I suggest you speak a little louder, sir.

By Mr. Osann:

Q. Mr. Lindell, what practical significance does this difference in explosion pressures have particularly with regard to wall thickness invented as compared with
111 heavy wall fixtures? A. Referring to our 500
watt——

The Court: Well, just answer the question directly; head on.

The Witness: All right, sir.

We are required to have heavier thicknesses of wall on the glass globe, and we had to use a high strength, a high alloyed strength type of aluminum material; whereas in the vented type we could use a wall thickness of glass much thinner, and a less costly low strength aluminum material.

The Court: Now, how much more will you have of this witness? I think this is rather repetitious here, Mr. Osann.

Mr. Osann: Just a few minutes more, Your Honor.

I want to bring out the structural and engineering advantages in the design of this invention, which resulted from the use of the invention of this application.

The Court: Well, we have that from the preceding witness, didn't we? Mr. Skrydlak testified to all that.

Mr. Osann: He touched on it to some extent, Your Honor, but not in detail.

The Court: Well, I don't want that. Details not necessary, are they?

Mr. Osann: I think that there are about three details here, Your Honor, that should be brought out.

The Court: Well, make it brief because there is so much repetition. You know, that there are other lawyers
112 and litigants waiting to get their cases tried. One
of the reasons for the long delays is that lawyers take too long to try cases.

If we could try three cases in the time it takes to try two, we would not have a backlog.

Mr. Osann: I appreciate that, Your Honor.

By Mr. Osann:

Q. Mr. Lindell, you have before you two drawings of 500 watt explosionproof fixtures, one heavy wall and one vented; is that correct? A. Yes, sir.

Q. The 500 watt vented fixture shown is shown on Plaintiffs' Exhibit 18, and the 500 watt heavy wall fixture is shown on Plaintiffs' Exhibit 21.

Will you tell me, briefly, what is the globe thickness in the fixtures shown in these two drawings? A. On the 500 watt non-vented type of fixture our wall thickness was three-quarters of an inch, and on the vented type of fixture, 64,029, the wall thickness was only nine thirty-seconds of an inch.

Q. Calling your attention to the metal walls in the fixtures shown in these two exhibits, briefly, what is the difference between the two? A. In the non-vented type of
fixture, as previously stated, we used a high alloyed
113 material and wall thicknesses were approximately
three-sixteenths of an inch; on the vented fixture,
low alloy, tensile strength material, with the wall thickness of approximately five thirty-seconds of an inch.

Q. What is the weight of the heavy wall fixture shown on this exhibit? A. The heavy wall fixture weighed approximately 30 pounds.

Q. What is the weight of the vented fixture shown on Exhibit 18? A. It weighed 19 pounds.

The Court: I have no doubt that there is a great deal of advantage in your fixture, but the only question that I have to decide is whether the prior art, on which the Commissioner relies, precludes you from getting a patent on your improvement.

There are many commercially desirable articles that are not patentable.

Mr. Osann: That is true, Your Honor, but I think that evidence of new trends in design, which can be traced to the invention, is relevant in this kind of case.

The Court: I am not inviting any response to my comment. I am trying to direct your attention to the issue in the case.

You may proceed.

114 By Mr. Osann:

Q. Mr. Lindell, in explosionproof light fixtures of the heavy wall type is there a condensation problem? A. Yes, there is, inasmuch as these fixtures are installed in hazardous areas, in highly humid areas, such as in the Southwest United States, where the majority of our oil refineries and oil——

The Court: Now, we have had all that from the witness Skyrdlak, Mr. Osann. I am not going to permit you to accumulate evidence on matters that are not in dispute, and that are not going to be disputed.

Mr. Osann: Well, I think I have made my point with this, Your Honor.

The Court: Is there any cross examination?

Mr. Cochran: No cross examination.

The Court: You may step down.

(Thereupon the witness was excused.)

Mr. Osann: Your Honor, I would like to call Mr. Wilgot J. Jacobsson to the stand.

Thereupon,

Wilgot J. Jacobsson

was called as a witness by the plaintiff and, being first duly sworn, was examined and testified as follows:

Direct Examination

By Mr. Osann:

115 Q. Mr. Jacobsson, will you state your full name to the Court? A. My name is Wilgot J. Jacobsson.

The Court: How do you spell your last name?

The Witness: J-a-c-o-b-s-s-o-n.

The Court: Spell it again a little louder, please.

The Witness: J-a-c-o-b-s-s-o-n.

By Mr. Osann:

Q. What is your residence, Mr. Jacobsson? A. I live in St. Petersburg, Florida, at 1846½ Eighteenth Avenue, North.

Q. Mr. Jacobsson, have you ever been connected with Union Carbide and Carbon Corporation, the assignee of the Baker patent? A. Yes.

Q. I was referring to Baker patent 2,447,048 involved here. A. Yes.

Q. How long were you employed by Union Carbide? A. Twenty-nine years.

Q. And when did you leave Union Carbide, if you did? A. In 1954.

Q. Have you worked as a developing engineer on welding and cutting torches, blow pipes, flame arresters, mixers, and related equipment for Union Carbide and
116 Carbon Corporation? A. Yes, sir.

Q. Are you familiar with the products of Union Carbide in the welding and cutting equipment line? A. Did you have charge of——

The Court: Well, I think you have identified the witness sufficiently. Suppose you get to the crux of his testimony.

By Mr. Osann:

Q. Mr. Jacobsson, you are familiar with the Baker patent, 2,447,048? A. Yes.

Q. Based on your work as a developing engineer for Union Carbide, do you know of any devices manufactured and sold by Union Carbide under that Baker patent? A. No.

Mr. Cochran: If Your Honor please, I fail to see that this is pertinent.

The Court: I am going to take the evidence. I have some doubt as to its relevancy.

I presume you are trying to show that this Baker patent has not been used. Is that what you are trying to show?

Mr. Osann: That it has not been used.

The Court: I say: Are you trying to show that the Baker patent has not been used?

117 Mr. Osann: Yes, sir, that is one of the things.

The Court: I will allow the evidence. You may answer.

The Witness: No.

By Mr. Osann:

Q. Mr. Jacobsson, does Union Carbide have plants, such as acetylene generating plants, in which there is a hazard of explosion if spark or flame accidently occurs in that area? A. Yes; if the percentage of acetylene in the mixture is 2 percent or more.

Q. Does Union Carbide take safety precautions in such plants and areas to guard against explosion? A. Yes.

Q. And you know what those precautions are? A. Yes.

Q. Do you know whether Union Carbide or anyone connected therewith has ever adapted the device of the Baker patent to an explosionproof lighting fixture for use in one of these acetylene plants? A. No.

Q. Do you know of any other use that Union Carbide has made of the device disclosed by the Baker patent, other than as a flame arrester for a welding or cutting a blow pipe?

The Court: You already asked him whether they

118 manufactured anything under the Baker patent. and he said, no.

Mr. Osann: I asked him, Your Honor, of any other use.

The Court: Well, you asked him.

Has there been any use of this patent?

The Witness: No.

The Court: Very well. That finishes it.

Mr. Osann: Your witness.

Mr. Cochran: I have no questions.

The Court: You may step down.

(Thereupon the witness was excused.)

Mr. Osann: Your Honor, I would like to call Mr. Frank W. Wehrheim to the stand.

Thereupon,

Frank W. Wehrheim

was called as a witness by the plaintiffs and, being first duly sworn, was examined and testified as follows:

Direct Examination

By Mr. Osann:

Q. Will you state your full name and address to the Court? A. Frank W. Wehrheim, W-e-h-r-h-e-i-m; 1834 Sunset Ridge Road, Glenview, Illinois.

119 Q. What is your present occupation? A. Vice President in charge of sales of Appleton Electric Company.

Q. How long have you been employed by the Appleton Electric Company? A. Approximately 37 years.

Q. What postions have you held with Appleton Electric Company? A. Stock record clerk, correspondent, assistant sales manager, sales manager; and vice president in charge of sales.

Q. Does Appleton Electric Company regularly maintain records of sales of its products?

The Court: Of course, I assume they do. Suppose you get to the crux of the matter. They would be in bankruptcy if they didn't.

By Mr. Osann:

Q. Mr. Wehrheim, do you have charge of the sales records?

The Court: Now, get to the crux of the case. You are spending too much time on preliminaries.

By Mr. Osann:

Q. Mr. Wehrheim, have you made a tabulation of the sales figures of Appleton Electric Company for about the past five years and relating to sales of vented explosion-proof lighting fixtures of the type exemplified in certain

120 physical exhibits here in the courtroom? A. I do and I have.

Mr. Osann: Will you mark this please?

I offer in evidence, Your Honor, as Plaintiffs' Exhibit 22, a tabulation of sales figures.

The Court: Show it to Mr. Cochran.

Mr. Cochran: No objection, Your Honor.

The Court: It may be admitted.

(The document was received in evidence and marked Plaintiffs' Exhibit No. 22.)

By Mr. Osann:

Q. I hand you Plaintiffs' Exhibit 22 and ask you if this is the tabulation to which you had reference? A. It is, sir.

Q. And it accurately reflects the sales figures of Appleton Electric Company of which you have charge? A. It does.

Mr. Osann: Your Honor, I had in mind asking the witness to explain briefly the arrangement of this chart.

The Court: No; I think it speaks for itself. It is perfectly clear and very well organized.

Mr. Osann: It goes two ways, as Your Honor will notice, down vertically and columns going across.

The Court: Yes, I see that.

By Mr. Osann:

Q. Mr. Wehrheim, the figures for 1956 on the chart,
121 Plaintiffs' Exhibit 22, specify that they are for the
first seven months. What is the reason for that?
A. The reason is due to the fact that we changed our fiscal year to begin on the first of August; and hence it reflects only a seven month period.

Q. Mr. Wehrheim, have you prepared a tabulation of sales figures for just the explosionproof units which are included as part of the complete explosionproof light fixtures of the vented type manufactured and sold by Appleton Electric Company? A. I have.

Mr. Osann: I ask that a tabulation of sales figures of fixture units be marked Plaintiffs' Exhibit 23.

The Court: Are you offering it in evidence?

Mr. Osann: And I am offering it in evidence, at this time, Your Honor.

Mr. Cochran: No objection.

The Court: It may be admitted.

(The document was received in evidence and marked Plaintiffs' Exhibit No. 23.)

By Mr. Osann:

Q. Mr. Wehrheim, I hand you Plaintiffs' Exhibit 23 and ask you if this is the tabulation to which you just referred? A. It is

122 Q. And it accurately reflects the sales records of Appleton Electric Company of which you have charge? A. It does.

Q. Mr. Wehrheim, based on your experience as vice president in charge of sales of Appleton Electric Company, will you tell me if you can the extent of the market for vented explosionproof lighting fixtures? A. The extent is limited to areas where hazards exist.

Q. And is that a more limited market than you would have for a conventional lighting fixture, for example? A. A considerably lesser market; yes.

Mr. Osann: Your witness, sir.

Mr. Cochran: I have no questions.

The Court: You may step down.

(Thereupon the witness was excused.)

Mr. Osann: The plaintiffs rest, Your Honor.

Mr. Cochran: If Your Honor please, as Defendant's case, I offer in evidence the folder which was handed to Your Honor during my opening statement.

The Court: It may be admitted.

(The document was received in evidence and marked Defendant's Exhibit No. 1.)

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Opinion of the Court

The Court: This is an action against the Commissioner of Patents under 35 U. S. Code Section 145 to secure an adjudication that the plaintiff is entitled to receive a patent for an invention described in an application filed by Nils A. Tornblom, Serial No. 789,444, filed on December 3, 1947. The application was denied by the Examiner, whose decision was affirmed by the Board of Appeals of the Patent Office.

The alleged invention is an electric lighting fixture of a type intended for use in hazardous places in which explosive gases might gather. The objective of the invention is to create a lighting fixture that would be explosionproof in the sense, that if an explosion occurred inside the fixture the explosion would not be communicated to the outside and the flame would be contained within the fixture. The inventor seeks to accomplish his objective by using and inserting in his fixture a porous metallic disc or screen, or a series of such discs or screens. It is asserted that in case an explosion occurs inside the fixture these porous metallic elements cause the gases to escape more slowly than they otherwise would and cool them while they are passing through the apertures of the metallic member, thereby preventing the explosion from being communicated to the outside.

The evidence shows that there has been considerable practical exploitation and use of this invention 135 by the plaintiff and that the plaintiff has sold large quantities of fixtures of the type on which a patent is sought. No doubt commercial success is a circumstance to be considered in connection with the question whether invention exists in a new product. This matter, however, is pertinent if the question of invention is a close one but is not determinative or conclusive because it is a well-known fact that many new articles come on the market from time to time that attain a commercial success but which do not rise to the dignity of a patentable invention.

The Patent Office denied the application on the ground that the applicant's device did not represent a patentable advance over the prior art. This brings us to a consideration of the pertinent items of the prior art. They will be considered in chronological order. The first is a patent to Williams, No. 321,166, issued on June 30, 1885. This patent covers safety lamps for use in mines known as Davy lamps. One of the vital features of the invention covered by the Williams patent is a wire gauze cylinder and an additional wire gauze protector in the top of the lamp to afford "safety against a rush of gas at any time into the lamp."

The next item of prior art is a patent to Keil, No. 489,150, issued on January 3, 1893. That patent also covers a lantern for use in mines, specifically, electric lanterns for that purpose. Keil states that one of his objectives was that in case of the breaking or cracking 136 of the bulb all fear of the igniting of any dangerous gases within the mine should be precluded. He accomplishes his object also by the use of a wire gauze within the lamp. He adds that as it is extremely desirable to prevent the passage of flame from the lantern in case of the ignition of the gases therein, he uses a supplemental gauze cap and so entirely precluding the passage of any such flame or spark in case of the breaking of the bulb and the ignition of any gas within the lantern in consequence thereof. Again, he says, "In case the lantern body should be crushed by any severe accident happening thereto by which the bulb would be cracked or broken, and cause the ignition of any gases which might be within the lantern body by the spark of the incandescent light, all liability of ignition or surrounding gases so as to cause an explosion, would be prevented by the gauze body of the lantern, so that the liability of the ignition of the gases is precluded under any circumstances." It is clear that Keil had the basic idea that has been utilized by the present applicant.

The next item in the prior art is an English patent to Gover, No. 23,369, issued on December 11, 1897. It relates to an improvement in electric safety fuses and states: "The casing of an electric safety fuse is frequently made with an opening for escape of gases when the fuse gives way. Should the fuse happen to be near combustible materials or gases there is danger of those being ignited
137 by the burning of the fuse or the temporary arc
produced at the moment of its fusion. The present invention has for its object to provide against this danger, by arranging the fuse and its casing as we shall describe referring to the accompanying drawing." He adds that "the casing has a large opening at the top covered with wire gauze, such as will give a free outlet for gases under pressure but will prevent communication of flame to the exterior."

The last pertinent item of prior art is a patent to Baker, No. 2,447,048, issued on August 17, 1948. This patent relates to flame arresters and uses a porous metal plate or, a deflector inserted in porous material, which will absorb the shock of a backfire and to spread the flame of a backfire prior to its entry into the pores of the porous element.

The Board of Appeals of the Patent Office held that in the light of the disclosures that have just been reviewed the use by the inventor in this case of a rigid porous metal disc or screen, for the purpose heretofore indicated, does not represent a patentable advance, rather than something that could be developed by a person reasonably skilled in the art. This Court agrees with the Patent Office. In any event, the Court concludes that there is a rational basis for the ruling of the Patent Office. Its decisions on technical matters, such as are presented here, are entitled to great weight.

138 The Court might add that there has been some discussions as to whether the Patent Act of 1952 embodied in Title 35 of the United States Code did not lower the standard of invention. Judge Learned Hand

in the case of *Lyon* v. *Bausch & Lomb Optical Company*, 224 Federal 2nd 530, discusses this question and intimates that perhaps the definition of invention under the present statute, though it is practically the same in phraseology as that under the old statute, is intended to accomplish this result, in the requirements as to what constitutes patentability, as formulated in decisions of the Supreme Court rendered during the period immediately preceding 1952. This Court has had that possibility in mind, but even under the less rigid standard, the Court is of the opinion that the Patent Office was correct or, at least, that it was justified in reaching the conclusion that it did.

Patentability is in part defined at present in 35 U. S. Code 103 as follows: "A patent may not be obtained though the invention is not identically disclosed or described as set forth in 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains."

This Court agrees with the ruling of the Patent Office
that in the light of the prior art the alleged inven-
139 tion in this case would have been obvious to a per-
son having ordinary skill in the art to which the
subject matter of the case is directed.

In view of these considerations, the Court will render judgment for the defendant on the merits.

Counsel may submit proposed finding of fact, conclusions of law, and a judgment.

Mr. Cochrane: When would it be appropriate to submit findings, Your Honor?

The Court: Just as soon as you can—within the next two or three days, and submit a copy first to your adversary.

Mr. Cochrane: Yes, sir.

The Court: You may submit them to the clerk.

Mr. Osann: Your Honor, of course, we would have leave to submit counter findings?

The Court: Oh, yes, you may submit counter findings.

I want to thank counsel on both sides of a very able and helpful presentation of this matter.

Mr. Osann: Thank you, Your Honor.

Mr. Cochrane: Thank you.

The Court: It has been very helpful to the Court.

Mr. Osann: Your Honor, one point about the exhibits. They will be in the custody, plaintiff's exhibits, will be in the custody of our Washington associate, Mr. Beveridge, and I trust it will be appropriate for us to remove them.

140 The Court: Yes, they may be turned back to your Washington associate. I am going to retain for the moment Plaintiff's Exhibit No. 3, that is your certification, and Defendant's Exhibit No. 1, being the file.

(Thereupon the trial was concluded.)

141 (The following occurred as a preliminary matter before Honorable Alexander Holtzoff, Judge of the United States District Court for the District of Columbia, in Civil Action No. 3200-54, *Appleton Electric Company, et al.*, vs. *Robert C. Watson*, on Monday, February 4, 1957, Andrew B. Beveridge, Esquire, appearing on behalf of the plaintiff, and Samuel W. Cochran, Esquire, on behalf of the defendant.)

The Deputy Clerk: Are there any other preliminary matters to come before the Court?

Mr. Cochran: If Your Honor please, in Civil Action 3200 54, *Appleton Company* v. *Watson*, I have prepared findings of fact for Your Honor's consideration.

The Court: Are they agreeable?

Mr. Beveridge: They are not agreeable, Your Honor. We would like to have an opportunity to present some additional findings.

The Court: Well, have you got them here now? You may do so.

Mr. Beveridge: Not here now, Your Honor. We just got these this morning, Your Honor, in the mail.

The Court: Oh, you just got them in this morning's mail?

Well, how much time do you want, two days?

Mr. Beveridge: That will be ample time for me, but my Chicago counsel have requested permission, however,
142 to get the transcript.

The Court: No, I don't do that.

Mr. Beveridge: You don't?

The Court: No.

Mr. Beveridge: All right.

Would Thursday morning be acceptable, Your Honor?

The Court: That is agreeable to the Court if it is agreeable to you.

Mr. Cochran: Yes, sir, that is agreeable.

The Court: There is no objection to getting the transcript, of course, but I don't wait for findings until the transcript is ready. I like to dispose of a matter while it is fresh in my mind.

Mr. Beveridge: I think counsel are finding some difficulty in recalling the exact evidence in the matter.

The Court: Well, they ought to take their own notes. The Court recalls it and I am sure you do.

I suggest then, Mr. Cochran, that you hold this and present it this Thursday morning.

Mr. Cochran: All right, sir.

(Thereupon the instant hearing was concluded.)

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143 Washington, D., C.,
Thursday, February 7, 1957.

Pursuant to adjournment theretofore taken, the trial of the above-entitled case was resumed at 10:00 o'clock a. m., on Thursday, February 7, 1957, in the United States District Court for the District of Columbia, in the Court House, at Washington, D. C.

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The Deputy Clerk: Are there any other preliminary matters to come before the Court?

Mr. Cochran: If Your Honor please, in Civil Action 3200-54, *Appleton Electric Company* vs. *Watson*, I would like to present again findings of fact and conclusions of law and an order for your consideration. If you remember, when we were before you on Monday, we gave us until this morning to give the plaintiff time to present findings.

The Court: Have you any objections to the proposed findings?

Mr. Beveridge: We do, Your Honor. We have counter findings here.

The Court: Wherein are the differences?

Mr. Beveridge: The differences lie primarily in the findings which the Patent Office has presented regarding or, rather, lack of findings, regarding the operativeness, commercial success, and the problem with which the invention is concerned.

The Court: What particular findings do you object to?

Mr. Beveridge: We object to all findings starting with No. 2.

The Court: Well, you have got to be a little more precise and definite. What do you object to?

I am not going to compare counter findings with
145 the findings of the prevailing party line for line.
I want counsel to tell me what the differences are.

Mr. Beveridge: Well the differences are primarily, Your Honor, that the findings that they make regarding the reference structures fail to include any statement regarding whether they are operative or not. For example——

The Court: Well, there was no proof as to whether they were operative or not. I am not going to make any findings on that.

Mr. Beveridge: I think Mr. Skrydlak, the expert, testified rather specifically as to the operativeness of each reference. For example, the Davy lamp was stated to be unsafe to be lit.

The Court: Well, I am not going to make any findings on the basis of one witness to the effect that the Davy lamp is unsafe, because it has been in use in mines ever since 1880. I want more proof before I make a finding that it is unsafe.

Mr. Beveridge: Well, those are the points involved, things like that.

The Court: I think it would be improvident on my part to make such a finding on the basis of the statement of one party as a witness.

Mr. Beveridge: Well, we had some record exhibits also,
I believe, on the Davy lamp, a textbook on physics,
143 some pages from that.

I might explain, Your Honor, that these findings have been presented in alternative form, but the first form is what we want, in other words, the top line.

The Court: I am not going to go into such details as you suggest. I think the Government's draft is satisfactory. I am going to sign the Government's draft.

Mr. Beveridge: Very well, sir.

The Court: Because it carries out my ruling. I realize that you, naturally, would not agree with it, but I am not going to weaken my ruling by diluting it with your proposed findings.

Mr. Beveridge: Well, we thought we had to do what we could to get it before you.

The Court: I don't say that in any critical way, you understand.

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UNDERWRITERS' LABORATORIES, INC.
For Service—Not for Profit
Sponsored by
NATIONAL BOARD OF FIRE UNDERWRITERS
207 East Ohio Street, Chicago 11
Electrical 19082
Application No. 47C2345
December 5, 1947

REPORT
on
X-RAY FILM ILLUMINATOR
FOR USE IN HAZARDOUS LOCATIONS,
CLASS I, GROUPS C AND D

Appleton Electric Co.
Chicago, Ill.

DESCRIPTION

DEVICE COVERED BY THIS REPORT:

X-ray film illuminator for fluorescent tube-type F15T12 lamps.

TYPE EFUX

Cat. No.	Fluorescent Tube Lamps	Rating of Lamps	Volts A-C, 60-Cy	Amp.
52950	Two 18-in	15 w	118	0.6

GENERAL CHARACTER AND USE:

The X-ray film illuminator covered by this report is of the explosion-proof design and has provision for connection of threaded rigid conduit. The device is provided with a cabinet for flush wall mounting, and the assembly is intended for use in viewing X-ray film in hospital operating rooms.

ASSEMBLY AND CONSTRUCTION DETAILS:

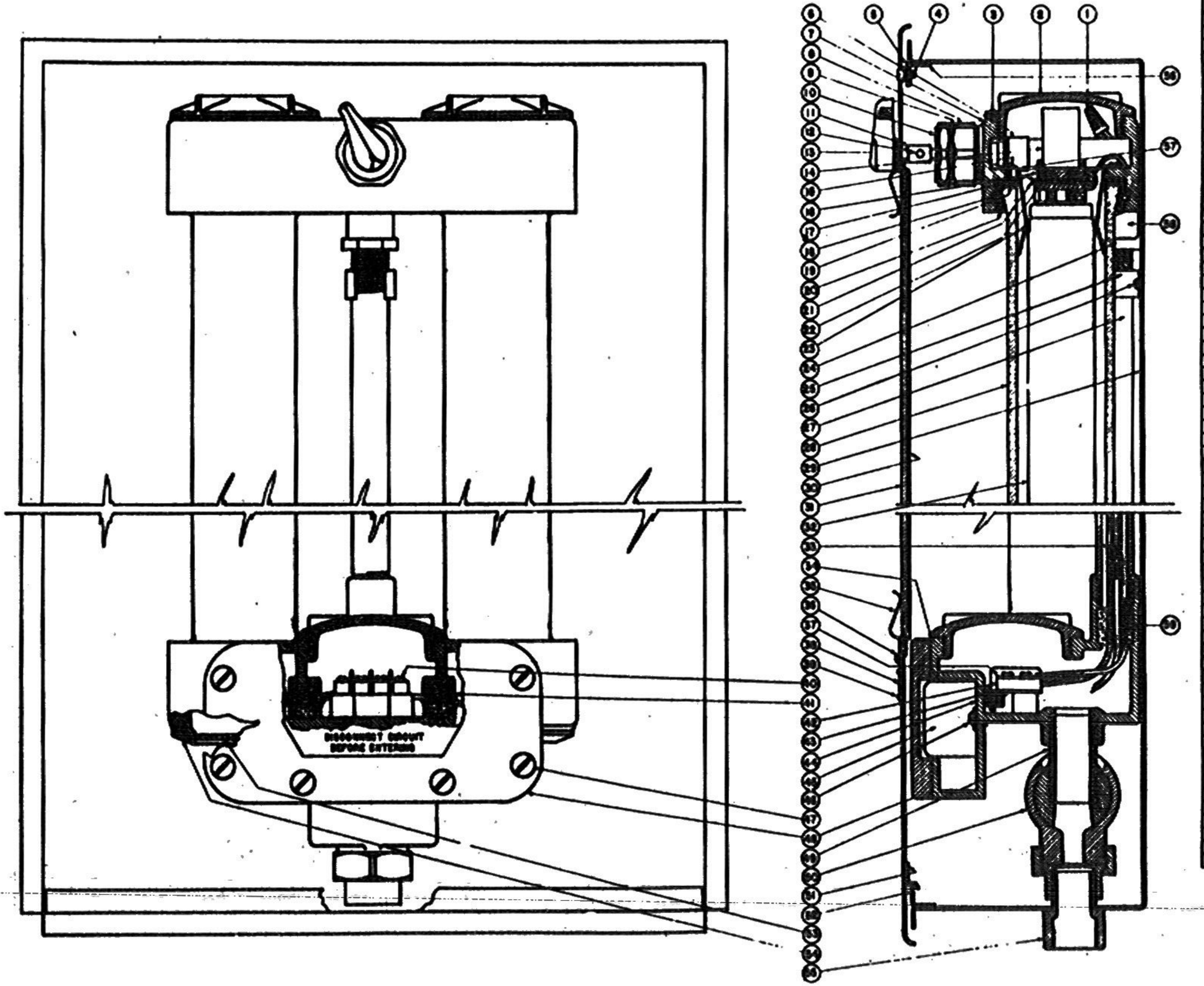
The general assembly of the device is shown in Figs. 1 and 2, of this report.

The fluorescent tube lamps of the device are enclosed in two heat-resistant glass tubes which are sealed in two end castings to form the explosion-proof enclosure for the lamps, sockets and starter. The ballast and a control switch are assembled in the lower and upper end castings respectively. A terminal block is provided in a separate enclosure for line connections, the wiring from this terminal block to the lamps, switch, and ballast being sealed in wells between the compartments, as shown in Fig. 1. The explosion-proof fixture is assembled in a metal cabinet with glass front as shown in Figs. 1 and 2. The hinge-type, explosion-proof fitting connected between the terminal-block enclosure and hub for connection to rigid conduit permits tipping of the fixture for relamping purposes as shown in Fig. 2.

The construction details of the illuminator are described below under separate headings, which description also includes the reference numbers shown in Fig. 1.

1. *Wire Connectors*—Listed fixture-type splicing connectors.

2. *Threaded Covers in Switch End Casting*—
   Number—Two
   Material—Cast aluminum
   Threading—At least five full threads, size $2\frac{13}{16}$ in.-16.
   Outside diameter over flange—$3\frac{3}{8}$ in.
   Inside diameter at threads—$2\frac{7}{16}$ in.
   Flange thickness—$\frac{1}{8}$ in.
   Thickness elsewhere—$\frac{5}{32}$ in.
   Tightening Lugs:
     Number—Three
     Thickness—$\frac{3}{16}$ in.
   Marking—"Disconnect Circuit before entering" and "Appleton Electric Co.," cast on cover.



ITEM	QU	B.P. NO.	DESCRIPTION	SIZE
1	7	65343	WIRE CONNECTOR	A
2	3	65324	COVER	B
3	3	P 4385	SCREW, 10-24 X 5/16 SL SET	DATA
4	1	P 4673	SCREW, 10-24 X 3/8 OV HD	DATA
5	1	6430-5	WASHER, RETAINING	A
6	1		SWITCH MECHANISM	
7	1	62007	END CASTING (SWITCH)	D
8			SWITCH COLLAR	
9			JOINT BETWEEN SW COLLAR & NUT	
10			SWITCH LOCKING NUT	
11	1	62004	SWITCH SHAFT EXTENSION	A
12	1	P4349	SCREW, 6-32 X 3/16 SOC. HD. SET	DATA
13	1	62005	HANDLE	HD
14	2	65339	STARTER, FS-2	HD
15	10	P4049-3	SCREW, 6-32 X 1/4 RD. HD.	DATA
16	2	65338	SOCKET	HD
17	4	65328	BRIDGE	B
18	4	65310	GASKET	B
19	8	65349	GASKET	B
20			SEAL	
21	4	65329	INSULATOR DISC	A
22	2	65337	LAMP HOLDER	HD
23	8	65330	SPRING CLIP	B
24	1	57442	LOCK NUT	A
25	1	62014	PIPE CLIP	D
26	2	P1047	SCREW, 4-36 X 1/8 RD HD	DATA
27	1	62003	CONDUIT 16 1/8" LONG	C
28	2	62009	PYREX GLASS	C
29	1	62011	HOUSING	D
30	1	62012	COVER	D
31	1	62020	GLASS	C
32	2		FLOURESCENT TUBES	HD
33	3	53321-1	WIRE, 18 A.F. WHITE (3' LGTH)	HD
34			JOINT BETWEEN COV & BODY OF HOUSING	
35	4	62013	CLIP	A
36	8	P7172	SCREW, 4-36 X 3/16 RD HD.	DATA
37			TERMINAL PLATE	
38	1	62008	NAMEPLATE	B
39	4	6164-2	DRIVE SCREW	A
40	2	P4514	SCREW, 6-32 X 1/2 RD HD.	DATA
41	1	59100	APELCO SEALING CEMENT	HD
42	1	65421-2	CONNECTION BLOCK	HD
43	1	65327	INSULATOR	A
44	1	62006	END CASTING (BALLAST)	D
45	1	62010	BALLAST (G.E. [illegible])	HD
46	2	P4035	SCREW, 10-32 X 1/4 RD. HD.	DATA
47	8	P2944	SCREW, 1/4-20 X 3/4 FL. HD.	DATA
48	1	62006	COVER, BALLAST	C
49		CAT. NE224	NIPPLE	
50	1	CAT. ES378	SWIVEL FITTING	
51			STEEL ANGLE ON CABINET COVER	
52			STEEL ANGLE ON CABINET	
53	2	62023	DISC	B
54	2	62022	COVER	B
55	1	62015	BRAZING HUB	B
56			STEEL ANGLE FOR COVER HOLDING SCREW	
57			BOSS FOR HOLDING SWITCH IN POSITION	
58			CONDUIT HUB	
59			WIRE SEAL	
	4	P2560	SCREW, 4-36 X 7/16 RD. HD.	DATA
	4	P4029	SCREW, 4-36 X 5/8 RD. HD.	DATA
	1	65318	TOOL	A

EXPLOSION PROOF
X-RAY FILM ILLUMINATOR
APPLETON ELECTRIC COMPANY
[illegible]
62350

FIG 1

BEST COPY AVAILABLE

Insert this sheet between pages 46-F and 47, section 12 of Appleton Electric Company's Catalog No.11
● Additional listing of Type "EFUX" Explosion-proof X-Ray Film Illuminator

August, 1947
Section 12, Page 46-G

•TYPE "EFUX" APPLETON EXPLOSION-PROOF X-RAY FILM ILLUMINATOR

CLASS I GROUPS C AND D

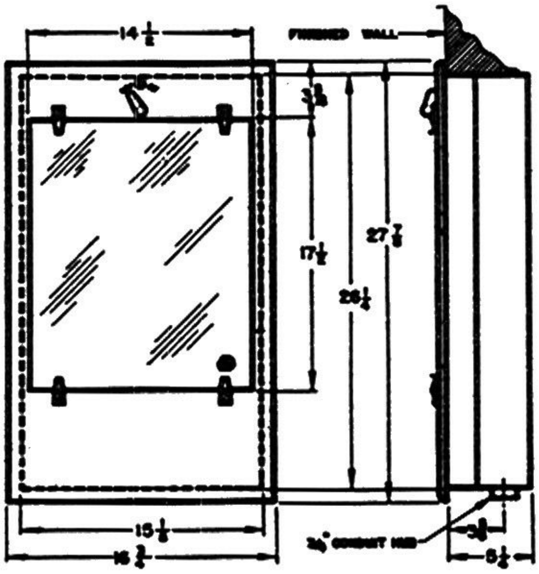
To take two 15 Watt T-12 Fluorescent Lamps†

Furnished With 110-125 Volt 60 Cycle Ballast

Type "EFUX" Explosion-proof X-Ray Film Illuminator with cover removed

The Type "EFUX" Explosion-proof X-Ray Film Illuminator is designed for flush mounting in Hospital Operating Rooms. This newly developed Illuminator is another step towards safety where hazardous gases are present.

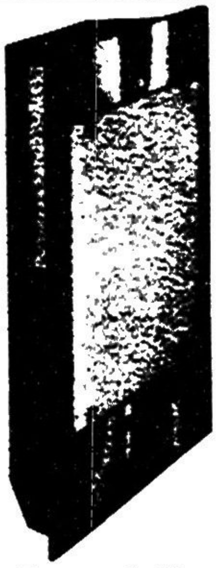
The fixture is simple in design and the glass cover panel is of sturdy, neat construction. The handle of the explosion-proof switch extends through the upper part of the panel, within convenient reach of the operator. Chrome-plated spring clips hold the glass and X-Ray film in place. A threaded hub for ¾ inch rigid conduit is provided in bottom of cabinet.



Dimensional Drawing

When installing, the metal cabinet should first be flush mounted in the wall. The fixture is mounted in cabinet with the use of a union (which is furnished). Line wires are connected to the connection block located under screw cover in lower housing. All other wiring and sealing is completed at the factory.

To relamp, remove switch handle, loosen the one cover screw and remove glass cover panel. Tip fixture out of the cabinet by releasing tension of spring clip (no tool is necessary for this operation) then remove screw cover and pull out lamp.



Patent applied for

Hub Size	Weight Each	Cat. No.	List Each
¾"	40 Lbs.	52950	$130.00

Finish—Cover steel, satin chrome. Housing—Protective coating outside, white enamel inside. Panel Glass, Opal.
†Fluorescent lamps not included.

Schedule "R" Discounts

FIG.2

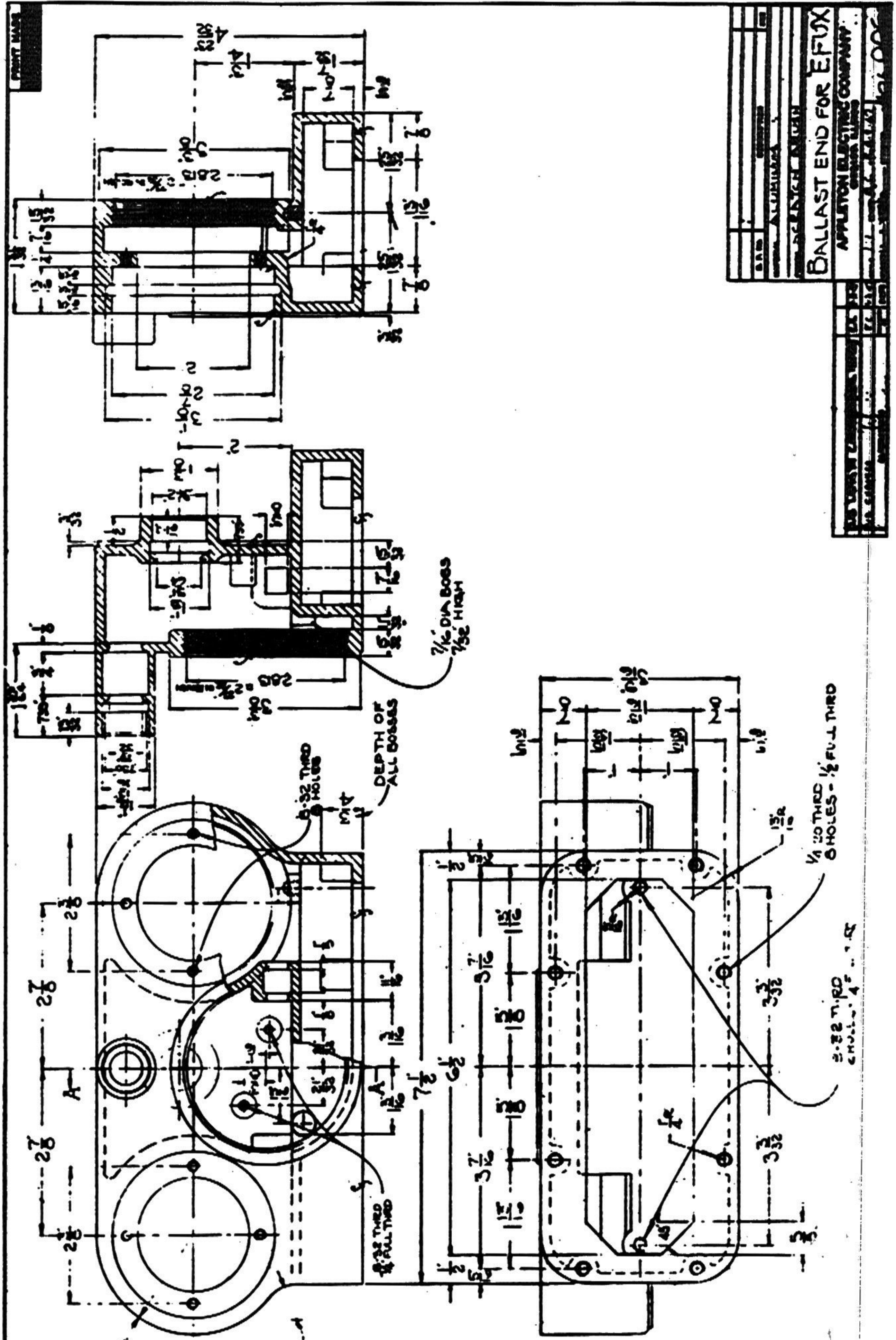

BALLAST END FOR EFUX
APPLETON ELECTRIC COMPANY
7/16" DIA BOSS 7/32 HIGH
DEPTH OF ALL BOSSES
8-32 THRD HOLES
8-32 THRD 1/2 FULL THRD
1/4-20 THRD 8 HOLES - 1/2 FULL THRD

FIG. 3

MARKING:

Name plate shows manufacturer's name, catalog number of device, size and ratings of tubes and ballasts and hazardous location marking, "Class I, Groups C and D."

THE INVESTIGATION

OBJECT:

The object of this investigation was to determine the status of the devices under the requirements covering the class.

PLAN:

Electrical features of the fixture were studied by reference to construction details. Since listed lampholders, combination lampholders with starter holders, starters, wire, fittings, switches, and fixture-type splicing connectors are provided in the device, no electrical tests were considered necessary.

Safety of use in hazardous locations, Class I, Groups C and D, was determined by conducting explosion tests with ethyl ether vapor-air mixtures. In addition, temperature and hydrostatic tests were conducted.

The uniformity in the manufacture and assembly of the devices, and their conformity with existing requirements, were studied by reference to construction details.

EXAMINATION AND TEST RECORD

DESCRIPTION OF SAMPLE

The manufacturer submitted representative sample of Type EFUX X-ray film illuminator, together with detailed drawings.

TEMPERATURE TESTS:

METHOD

The sample illuminator was installed in normal vertical position as intended in service with a wooden box of ¾-in.

pine placed around the device so that there was a clearance of approximately ½ in. between metal cabinet and the wooden box.

Connections were made to supply lines, the voltage of which could be controlled and the fixture was operated until equilibrium temperatures were attained. Number 28 Awg iron-constantan thermocouples were located at critical points on the cabinet, fixture, and inside the fixture. The locations of thermocouples are indicated in table under "Results."

Temperature tests in air were conducted with ambient temperature of 40 C (104 F), with line voltage of 118 v, ac, and 125 v, ac. Ampere input to fixture was measured at these voltages.

RESULTS

Temperature data and ampere ratings are given in following table:

Thermocouple No.	Location of Thermocouple	Max Temperatures (Ambient Temp of 40 C)	
		118 Volt Line †	125 Volt Line †
1	Upper right-hand glass tube seal	62 C (143.6 F)	66 C (150.8 F)
2	Top center of threaded cover above right-hand glass tube	57 C (134.6 F)	60 C (140 F)
3	Right-hand glass tube about 1½ in. below seal	68 C (154.4 F)	72 C (161.6 F)
4	Top of ballast, about 2 in. from supply line end	68 C (154.4 F)	78 C (172.4 F)
5	Connection block	60 C (140 F)	66 C (150.8 F)
6	Top of ballast enclosure above thermocouple No. 4	58 C (136.4 F)	64 C (147.2 F)
7	Outside back center of metal cabinet about 3 in. from top	52 C (125.6 F)	54 C (129.2 F)
8	Middle of cabinet glass front about 3 in. from top of glass		
9	About 2 in. below upper end on fluorescent tube lamp in right-hand glass tube	48 C (118.4 F) 102 C (215.6 F)	50 C (122 F) 108 C (226.4 F)

---

† The circuit characteristics were:
118 v, ac, 38.5 w, 0.71 amp.
125 v, ac, 44.5 w, 0.83 amp.

EXPLOSION TESTS:

Explosion tests with ethyl ether vapor-air mixtures were conducted on the terminal-block enclosure, and on the remainder of assembly consisting of Pyrex glass tubes and end castings.

METHOD

The device was drilled and tapped for connection to pressure indicators, for mounting of spark plugs, and for inlet and outlet connections to a specially designed carburetor developed at Underwriters' Laboratories, Inc. for preparing the predetermined concentrations of explosive ethyl ether vapor-air mixtures. The device, without the cabinet, was installed (glass tubes horizontal) in a test chamber also having connections to the specially designed carburetor. The test chamber was provided with windows for observation of the device during tests.

The explosion tests were conducted on both the terminal-block enclosure and the remainder of assembly as follows: With the inlet and outlet connections to the carburetor open, the explosive ethyl ether vapor-air mixture was introduced into the device and test chamber until the air was replaced by the ethyl ether vapor-air mixture. Samples of the explosive vapor-air mixture were withdrawn for analyses from the pipe line carrying the mixture to the setup and from the device. The inlet and outlet connections were then closed and the mixture within the device ignited.

The device was observed during each test for the appearance of sparks or flame from the device.

At the conclusion of each test, the products of combustion were removed from the device by a stream of air.

The following series of tests were conducted:

Terminal-Block Enclosures

Test Series No. 1—With a 2-ft. length of ¾-in. conduit connected to supply line conduit hub of enclosure, the explosive mixtures were ignited by means of a spark plug in conduit at a point of about 20 in. from the enclosure.

Test Series No. 2—The 2-ft. length of conduit referred to in test series No. 1 was replaced with a 5-ft. length of ¾-in. conduit and the explosive mixtures were ignited by a spark plug located in the conduit about 4 ft. 8 in. from the enclosure.

Test Series No. 3—The 5-ft. length of conduit referred to in test series No. 4 was replaced with a 10-ft. length of ¾-in. conduit and the explosive mixtures were ignited by a spark plug located in the conduit about 9 ft. 8 in. from the enclosure.

Test Series No. 4—The 10-ft. length of ¾-in. conduit referred to in test series No. 3 was replaced with a 15-ft. length of ¾-in. conduit and the explosive mixtures were ignited by a spark plug located in the conduit about 14 ft. 8 in. from device.

Glass Tubes and End Castings Assembly

Test Series No. 1—With the fluorescent tube lamps in place, ignition of the explosive mixtures in the enclosure were obtained by means of a spark plug located just above seal, Item 59 of Fig. 1, in length of ½-in. conduit connected to both end castings of enclosure assembly. Under these conditions the flame propagated through the ½-in. conduit to upper end casting and then through both glass tubes to ballast compartment which is sealed off from the terminal block compartment. Pressure indicators were connected to both end castings.

Test Series No. 2—Instead of spark ignition referred to in test series No. 1, the explosive mixtures in the enclosure were ignited by means of a spark plug connected in the upper end casting of device.

Test Series No. 3—Ignition of the explosive mixtures in the enclosure were obtained by means of a spark plug connected in the ballast or lower end casting of device.

Test Series No. 4—The fluorescent tube lamps were connected to a 115-v, a-c supply and when the device reached approximately maximum operating temperatures, the explosive mixtures in the enclosure were ignited by the spark plug connected in the upper end casting of device.

Test Series No. 5—This series of tests was conducted as described in test series No. 2 except that approximately 75 per cent of the area of the porous plates in lower covers of device were sealed off on the inside.

Test Series No. 6—This series of tests was conducted as described in test series No. 2 except that the fluorescent tube lamps were removed from the device.

RESULTS

No failure occurred in the tests conducted. The maximum explosion pressures obtained in tests were 212 psi in the terminal-block enclosure and 48 psi in the enclosure for ballast, fluorescent tube lamps and their accessories. The results of explosion tests are summarized in Tables I and II for the respective enclosures.

TABLE I

EXPLOSION TEST DATA

Terminal Block Enclosure of X-Ray Film Illuminator

Test No.	Test Series No.	Percent By Volume Of Ethyl Ether Mixture With Air	Room Temp C	Length of Conduit Connected To Conduit Hub. Ft.	Maximum Explosion Pressure PSI
1	1	3.40	28	2	182
2	1	3.87	28	2	17
3	1	3.72	28	2	161
4	1	3.61	28	2	173

Test No.	Test Series No.	Percent By Volume Of Ethyl Ether Mixture With Air	Room Temp C	Length of Conduit Connected To Conduit Hub. Ft.	Maximum Explosion Pressure PSI
5	1	3.47	28	2	206
6	1	3.31	28	2	197
7	1	3.35	28	2	190
8	1	3.16	28	2	202
9	1	3.72	28	2	198
10	1	3.46	28	2	212
11	1	3.40	29	2	168
12	1	3.37	29	2	184
13	1	3.53	29	2	168
14	1	3.76	29	2	168
15	1	3.51	29	2	184
16	1	3.63	29	2	184
17	1	3.28	29	2	176
18	1	3.76	28	2	212
19	1	3.69	28	2	180
20	1	3.19	28	2	176
21	2	3.61	31	5	62
22	2	3.65	31	5	58
23	2	3.56	31	5	81
24	2	2.97	31	5	43
25	2	3.18	31	5	67
26	2	3.46	31	5	91
27	2	4.05	31	5	57
28	2	4.19	31	5	65
29	3	3.70	31	10	50
30	3	3.63	31	10	46
31	3	3.57	30	10	55
32	3	4.25	30	10	58
33	3	3.80	30	10	53
34	3	3.16	28	10	10
35	3	3.32	28	10	41
36	4	3.18	28	15	14
37	4	3.34	28	15	12
38	4	3.54	28	15	12
39	4	3.61	28	15	5

TABLE II

EXPLOSION TEST DATA

Enclosure for Ballast and Fluorescent Tube Lamps of X-Ray Film Illuminator

Test No.	Test Series No.	Percent By Volume of Ethyl Ether Vapor In Mixture With Air	Room Temp C	Maximum Explosion Pressure, PSI Switch End Casting	Maximum Explosion Pressure, PSI Ballast End Casting
1	1	3.56	31	36	47
2	1	2.97	31	16	19
3	1	3.18	31	24	26
4	1	3.46	31	34	45
5	1	4.05	31	26	30
6	1	4.19	31	25	29
7	1	3.70	31	36	46
8	2	3.63	31	29	36
9	2	3.57	30	30	37
10	2	4.25	30	24	33
11	2	3.80	30	30	36
12	2	3.16	28	21	27
13	2	3.32	28	27	27
14	2	3.18	28	27	27
15	2	3.34	28	33	39
16	2	3.54	28	33	38
17	2	3.61	28	36	48
18	2	3.40	28	36	45
19	2	3.87	28	27	33
20	2	3.72	28	36	42
21	2	3.61	28	33	39
22	2	3.47	28	30	45
23	2	3.31	28	30	38
24	2	3.35	28	33	38
25	2	3.16	28	24	27
26	3	3.72	28	21	18
27	3	3.46	28	18	15
28	4	3.40	29	30	39

Test No.	Test Series No.	Percent By Volume Of Ethyl Ether Mixture With Air	Room Temp C	Maximum Explosion Pressure, PSI Switch End Casting	Ballast End Casting
29	4	3.37	29	30	39
30	5	3.53	29	65	98
31	5	3.76	29	56	66
32	5	3.51	29	55	81
33	5	3.63	29	58	99
34	5	3.28	29	55	96
35	6	3.76	28	36	47
36	6	3.69	28	34	42
37	6	3.19	28	34	32

HYDROSTATIC TESTS:

METHOD

The two enclosure sections of the device were in turn subjected to a hydrostatic test in which the internal pressure was increased at a rate of about 100 psi per minute until the pressure was at least four times maximum pressure obtained in explosion tests.

RESULTS

The terminal block enclosure withstood a pressure of at least 848 psi (four times 212 psi) for a period of one minute without rupture or permanent distortion.

The enclosure for ballast, fluorescent tube lamps and accessories withstood a pressure of at least 192 psi (four times 48 psi) for a period of one minute without rupture or permanent distortion. On increasing the internal pressure one of the Pyrex glass tubes broke at a pressure of 250 psi.

RECORD IN SERVICE

The illuminator has not been subjected to the test of actual service.

THE SUBMITTOR

This manufacturer is experienced in the manufacture of electrical devices for use in hazardous locations, a large number of which have been listed for this manufacturer.

SUPERVISION OF PRODUCT BY UNDERWRITERS' LABORATORIES, INC.

The X-ray film illuminator will be placed under Reexamination Service for devices for hazardous locations.

CONCLUSION

The X-ray film illuminator fully complies with the examination and test requirements for the classification and is so constructed that when properly installed in compliance with the National Electrical Code it can be operated without causing ignition of ambient explosive and flammable atmospheres, Class I, Group C or Group D. The device met requirements in the temperature, explosion, and hydrostatic tests conducted on the samples as indicated under "Examination and Test Record" of this report.

RECOMMENDATION

TO THE ELECTRICAL COUNCIL OF UNDERWRITERS' LABORATORIES, INC.

We recommend promulgation of the following notice to subscribers and the action indicated thereby:

Guide No. 320 I50.3 December 5, 1947 File E19082.
(320 I50.4.)
Appleton Electric Co., Mfr.,
1701-29 Wellington Ave., Chicago 13, Ill.
Picture Machine Appliances
For Use in Hazardous Locations,
Class I, Group C (and Class I, Group D).

X-ray film illuminator, fluorescent-lamp type, threaded for rigid conduit connection.

Type EFUX, for fluorescent-tube lamps F15T12, 18-in. length:

Cat. No.	Number of Fluorescent Tube Lamps	Rating of Lamps	Volts, AC 60 Cy	Max Amp
52950	2	15 w	118	0.60

Safety of use in hazardous locations will be endangered should opening or other alterations be made in the devices. Threaded parts and holding screws must be kept tight.

Protection against explosion in hazardous locations requires that all electrical equipment exposed to the hazardous atmospheres be of a type suitable and safe for installations in such locations. Equipment should be installed in circuits with overload and short-circuit protection for established ratings.

Marking: Manufacturer's name and catalog number.

Listed—Reexamination Service.

See description of Reexamination Service on guide card.

Examination and Tests by:

R. J. Iwans
M. D. Peterson
E. J. Schlosser
S. Skrydlak

Report by:

M. D. Peterson
M. D. Peterson,
Asst. Chemical Engineer.

Reviewed by:

W. R. Rilling
W. R. Rilling,
Associate Electrical Engineer.
W. C. Westerberg
W. C. Westerberg,
Asst. Chemical Engr.

Submitted:

A. F. MATSON
A. F. Matson
Chemical Engineer.

The foregoing Recommendation has been accepted January 2, 1948.

UNDERWRITERS' LABORATORIES, INC.,
(Signed) W. S. AUSTIN, Secretary

MDP:CM

UNDERWRITERS' LABORATORIES, INC.
For Service—Not for Profit
Sponsored by
NATIONAL BOARD OF FIRE UNDERWRITERS
207 East Ohio Street, Chicago 11
Electrical 19082
Application No. 50C1031
March 8, 1950

REPORT
on
X-RAY FILM ILLUMINATOR FOR USE IN HAZARDOUS LOCATIONS, CLASS I, GROUPS C AND D

Appleton Electric Co.
Chicago, Ill.

INTRODUCTION

Since listing of this manufacturer's Type EFUX X-ray film illuminator for use in Class I, Groups C and D hazardous locations covered in Report E19082 dated December 5, 1947, the catalog numbers have been changed and minor revisions as referred to in this Report have been made.

DESCRIPTION

DEVICES COVERED BY THIS REPORT:

X-ray film illuminators for fluorescent tube-type F15-T12 lamps.

TYPE EFUX

Catalog No.	Fluorescent Tube Lamps	Rating of Lamps	Volts, AC, 60 Cy	Amperes
A-182A, -D, -E, -F[†]	Two 18 in	15 w	118	0.6

[†] Previous catalog number was 52950.

ASSEMBLY AND CONSTRUCTION DETAILS:

The general assemblies of the devices are shown in Fig. 1 (manufacturer's Catalog, Pages 46-G and 46-H) of this Report.

The construction details of these X-ray film illuminators are the same as those of the manufacturer's listed device covered in our Report E19082 dated December 5, 1947 except as described below:

(1) The width of external threading on switch hub of switch end casting is about ½ in.

(2) The following marking is stamped on outer face of switch lock nut: "Type SWH" "OFF-ON" "3 Amp, 250 V" "Appleton." "Keep Threaded Parts Tight, Disconnect Circuit Before Entering."

(3) The switch shaft extension has a length of 1 in.

(4) The starters are listed FS-2, rated 18 in., 15 w, and 24 in., 20 w.

(5) The tube clip screws are No. 8-32 wire-binding head screws, ¼-in. long, and pass through looped center section of each clip and thread into tapped hole of end casting adjacent tube openings.

(6) The metal gasket at end of Pyrex tube is $\frac{1}{32}$-in. thick cadmium-plated steel about $2\frac{25}{32}$ in. outside diameter and about 2 in. inside diameter. Two asbestos gaskets are provided at each end between tube and metal gasket.

(7) The material of the tube centering clips may be spring bronze or basic steel wire.

(8) The wire is listed Type AF wire manufactured by Rockbestos Products Corp. and identified as Type WFCF wire. It has a cellulose-acetate butyrate wrap over the copper wire.

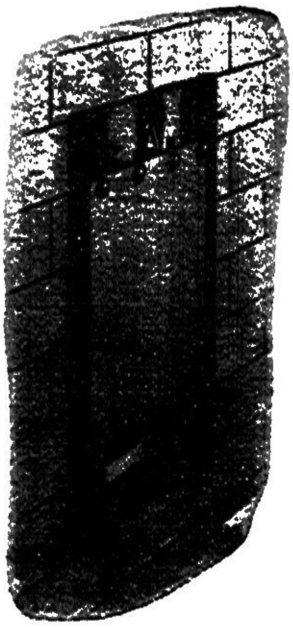
(9) The ballast may be Chicago Transformer Company's listed Cat. No. 70-2611 rated 118 v, 60 cy, 0.32 amp, 15 w.

TYPE "EFUX" APPLETON EXPLOSION-PROOF X-RAY FILM ILLUMINATOR

WITH EXPLOSION-PROOF SWITCH

CLASS I, GROUPS C AND D

To take two 15 Watt T-12 Fluorescent Lamps†
Furnished With 110-125 Volts 60 cycle Ballast



Type "EFUX" Explosion-proof X-Ray Film Illuminator, flush mounting in tile wall

PATENT APPLIED FOR

The Type "EFUX" Explosion-proof X-Ray Film Illuminator is designed for flush mountings in Hospital Operating Rooms. This newly developed Illuminator is another step towards safety where hazardous gases are present.

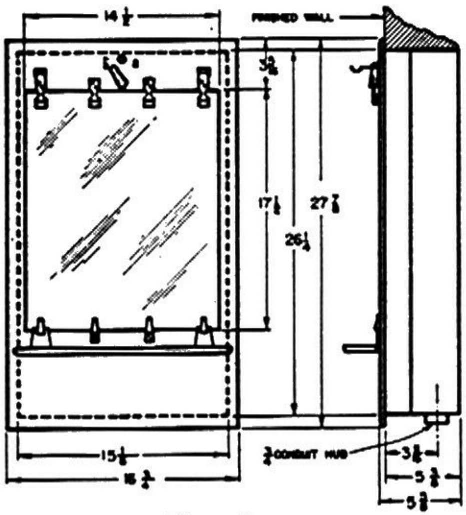
The fixture is compact and includes an EXPLOSION-PROOF SWITCH which eliminates the need of an additional switch Unilet. The handle of the Explosion-proof switch extends through the panel within convenient reach of the operator. The glass cover panel is of sturdy, neat construction. Four chrome plated roller clips at top of glass are provided to hold the X-Ray Film. Two extended hinge clips are furnished to support the wet film holder. A drip tray may be used and can be easily adapted to two of the four lower clips which hold the panel.

A threaded hub for ¾" rigid conduit is provided in cabinet.

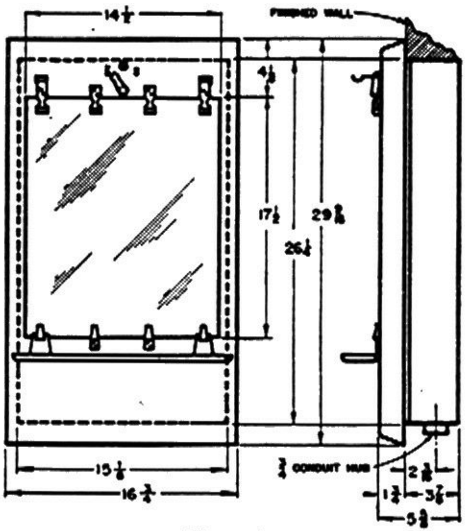
Two cabinet styles, one shallow and one deep, are obtainable as illustrated in dimensional drawings below.

When installing, the metal cabinet should first be mounted in the wall. The fixture is mounted in cabinet with the use of a union (which is furnished). Line wires are connected to the connection block located under screw cover in lower housing. All other wiring and sealing is completed at the factory.

To relamp, remove switch handle, loosen one cover screw and remove plastic glass panel cover. Tip fixture out of the cabinet by releasing tension of spring clip (no tool is necessary for this operation) then remove screw cover and pull out lamp.



Dimensions For Flush Mounting



Dimensions For 1¾" Flanged Cover Mounted in 4" Wall

SEE LISTING ON PAGE 46-H, THIS SECTION

†Fluorescent Lamps not included.

FIG. 1

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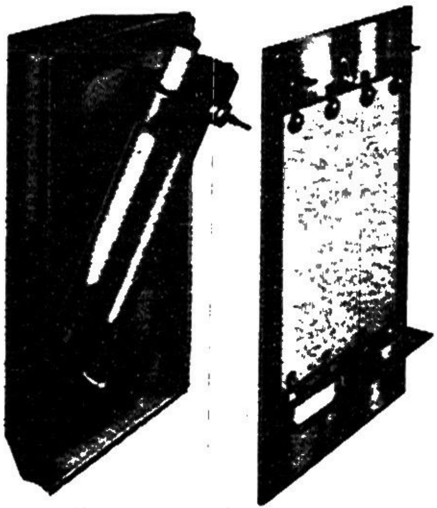
Superseding page 46-G, section 12 of the Appleton Electric Company's Catalog No. 11.
●Additional listing of Cat. Nos. A-182A, A-182B, A-182C, A-182D, A-182E and A-182F. Cat. No. 52950 discontinued.

TYPE "EFUX" APPLETON EXPLOSION-PROOF X-RAY FILM ILLUMINATOR

WITH EXPLOSION-PROOF SWITCH

CLASS I, GROUPS C AND D

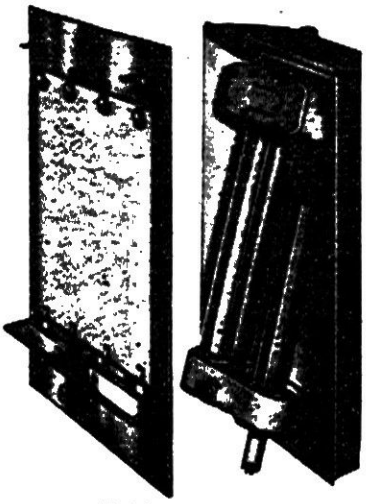
To take two 15 Watt T-12 Fluorescent Lamps†
Furnished With 110-125 Volts 60 Cycle Ballast



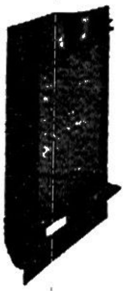
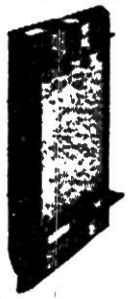
Type "EFUX" Explosion-proof X-Ray Film Illuminator with cover removed

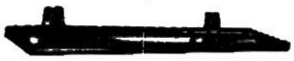
The Type "EFUX" Explosion-proof X-Ray Film Illuminator is designed for bottom entrance of conduit, however the complete unit can be inverted when mounted in the wall to allow for conduit entrance at the top (see illustrations.)

When cabinet is mounted with hub at top, the switch handle will be at the bottom. If a drip tray is to be used, a handle with an extension is included. This handle is located under the drip tray for easy elbow operation.



Type "EFUX" Explosion-proof X-Ray Film Illuminator inverted and with cover removed

	Hub Size	Weight Each	Construction	Cat. No.	Price
	¾"	40 Lbs.	Flush Mounting With Opal Plastic Glass Without Drip Tray	A-182A	●
			Flush Mounting With Opal Plastic Glass With Drip Tray	A-182D	●
	¾"	40 Lbs.	With 1¾" Flanged Cover For 4" Walls With Opal Plastic Glass Without Drip Tray	A-182E	●
			With 1¾" Flanged Cover For 4" Walls With Opal Plastic Glass With Drip Tray	A-182F	●



DRIP TRAY

Cat. No.	Price
A-182B	●

UTILITY HANDLE*

Cat. No.	Price
A-182C	●

Finish:—Cover Steel, Satin Chrome—Housing, Protective Coating Outside, White Enamel Inside. Drip Tray—Stainless Steel.

†Fluorescent Lamps not included.

***Utility Handle.**—To be used if unit is inverted and Drip Tray is used.

● **See Net Price Sheet**

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MARKING:

The markings are identical with those covered in Report E19082 dated December 5, 1947.

THE INVESTIGATION

PLAN:

Since these devices are similar to manufacturer's listed Type EFUX X-ray film illuminators for use in Class I, Groups C and D hazardous locations covered in Report E19082, dated December 5, 1947, no electrical tests, hydrostatic tests, temperature tests, or tests in Class I, Groups C and D hazardous locations were considered necessary.

CONCLUSION

These X-ray film illuminators comply with the present requirements covering the class and are eligible for listing under Reexamination Service.

The cards of listing have been revised to include the change in catalog numbers of the devices.

Report by:

M. D. PETERSON
M. D. Peterson,
Asst. Chemical Engineer.

Reviewed by:

W. C. WESTERBERG
W. C. Westerberg,
Asst. Chemical Engineer.

MDP:BJS

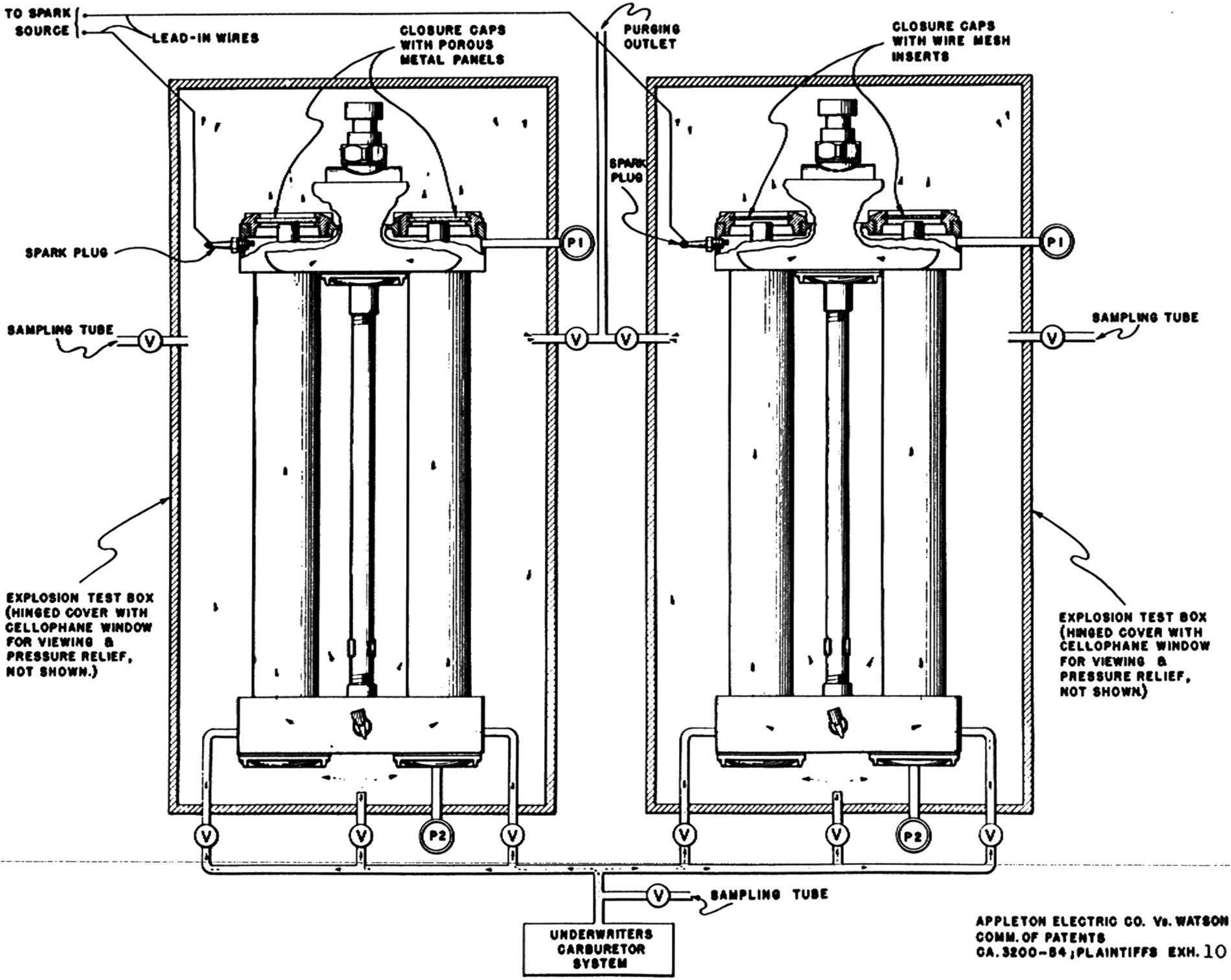
EXHIBIT 9

* * * * * * * * * *

The great conducting power for heat of copper is illustrated by the following experiment. If a piece of copper wire gauze is held over a Bunsen burner the flame is seen to burn below but not above the gauze. This is not because there is no combustible gas above, but because the heat of the flame is carried away so rapidly by the metal that the temperature above the gauze does not rise sufficiently to ignite the combustible mixture of air and coal gas. If the flame is extinguished and a light applied above the gauze, the gas burns above but not below. This experiment explains the action of the Davy safety-lamp, which consists of a small oil lamp burning inside a copper gauze cylinder. The lamp may be taken with impunity into a dangerous mixture of air and fire-damp (methane). The mixture burns quietly *inside* the cylinder, but owing to the conductivity of the gauze, the temperature does not rise sufficiently outside to cause explosion. Up to a little above the level of the flame the gauze cylinder is lined with a glass cylinder, the object of which is to prevent the flame, driven by a sudden draught, from being brought into contact with, and possible *through,* the gauze and setting fire to the explosive mixture outside; it has the further advantage of allowing more light to pass through.

* * * * * * * * * *

DIAGRAM OF EXPLOSION TEST SET-UP AT UNDERWRITERS LABORATORIES, INC.


TO SPARK SOURCE
LEAD-IN WIRES
CLOSURE CAPS WITH POROUS METAL PANELS
PURGING OUTLET
CLOSURE CAPS WITH WIRE MESH INSERTS
SPARK PLUG
SPARK PLUG
P1
P1
SAMPLING TUBE
V
SAMPLING TUBE
EXPLOSION TEST BOX (HINGED COVER WITH CELLOPHANE WINDOW FOR VIEWING & PRESSURE RELIEF, NOT SHOWN.)
EXPLOSION TEST BOX (HINGED COVER WITH CELLOPHANE WINDOW FOR VIEWING & PRESSURE RELIEF, NOT SHOWN)
P2
P2
SAMPLING TUBE
UNDERWRITERS CARBURETOR SYSTEM

APPLETON ELECTRIC CO. Vs. WATSON
COMM. OF PATENTS
CA. 3200-54; PLAINTIFFS EXH. 10

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EXHIBIT 13

UNDERWRITERS' LABORATORIES, INC.
For Service—Not for Profit

Sponsored by
NATIONAL BOARD OF FIRE UNDERWRITERS

In replying
Please Refer to E19082
56C7425

Chicago 11, Illinois,
January 9, 1957.

Appleton Electric Company
1701-1759 Wellington Avenue
Chicago 13, Illinois

Attention: Mr. Carl H. Lindell,
Chief Division Engineer
Subject: Catalog No. A-182G X-Ray Film Illuminators for Use in Hazardous Locations, Class I, Groups C and D.

Gentlemen:

As requested in your letter of December 13, 1956, we have conducted explosion tests on the two, sample Cat. No. A182G X-Ray film illuminators for use in hazardous locations, Class I, Groups C and D. These tests were conducted to determine the possibility of using 20 or 40 mesh wire screening in place of the Porex metal presently provided on your listed devices.

One sample provided was identified as your listed Cat. No. A182G X-Ray film illuminator. The other sample was identical except that wire mesh screening was used in the two fluorescent tube enclosure covers, in place of Porex.

For the explosion tests each pyrex glass tube-end casting assembly was drilled and tapped for connection to pressure indicators, for mounting of spark plugs, and for inlet connections to a specially designed carburetor developed at Underwriters' Laboratories, Inc. for preparing the predetermined concentrations of explosive ethyl ether vapor-air mixtures. The outlet, from the devices was provided through the venting covers. Each device, without cabinet, was installed in a test chamber also having connections to the specially designed carburetor. Each test chamber was provided with a window for observation of the device during tests.

The explosion tests were conducted as follows. With the inlet and outlet connections to the carburetor system open, the explosive ethyl ether vapor-air mixture was introduced into the devices and test chambers until the air was replaced by the ethyl ether vapor-air mixture. Samples of the explosive vapor-air mixture were withdrawn for analysis from the pipe line carrying the mixture to the set-up, and from the test chambers. The inlet and outlet connections were then closed and the mixture within each device ignited by means of the spark plug.

Each device was observed during test for the appearance of sparks or flame from the device.

The explosive mixtures surrounding the device having the screens in cover exploded in each test as indicated below, whereas, in the case of the device with porous plates in the covers, no flame or sparks emitted from the device and no ignition of the surrounding explosive mixtures occurred.

A summary of the tests conducted is given below:

Enclosure for Ballast and Fluorescent Tube Lamps of Listed Cat. No. A182G X-Ray Film Illuminator, Having Porex Covers

Test No.	Per Cent by Volume of Ethyl Ether Vapor in Mixture With Air	Room Temp Deg C	Max Explosion Pressure Lb/PSI	Results
1	3.27	23	85	No Failure
2	3.32	23.5	94	No Failure
3	3.97	22	21	No Failure
4	3.74	22	22	No Failure
5	3.63	23	22	No Failure
6	2.95	23	11	No Failure
7	3.01	26	14	No Failure
8	3.76	23	11	No Failure
9	4.05	24.5	6	No Failure
10	3.22	26.5	19	No Failure

Enclosure for Ballast and Fluorescent Tube Lamps of Cat. No. A182G X-Ray Film Illuminator Having Covers With Wire Mesh Screen

Test No.	Per Cent of Volume of Ethyl Ether Vapor in Mixture With Air	Room Temp Deg C	Mesh of Wire Screening in Cover	Maximum Explosion Pressure Lb/PSI	Results
1	3.27	23	20	13	Ambient mixture exploded
2	3.32	23.5	20	10	”
3	3.97	22	20	Less than ½	”
4	3.74	21	20	5	”
5	3.63	23	40	Less than ½	”
6	2.95	23	40	Less than ½	”
7	3.01	26	40	Less than ½	”
8	3.76	23	40	Less than ½	”
9	4.05	24.5	40	Less than ½	”
10	3.22	26.5	40	Less than ½	”

The results of the tests, in which wire mesh screening was used in the covers of the illuminators, are not considered acceptable.

This completes our work on Assignment No. 56C7425. The samples are being returned to you.

Very truly yours,

M. D. Peterson
M. D. Peterson,
Senior Project Engr.,
Chemical Department.

W. C. Westerberg
W. C. Westerberg,
Assoc. Managing Engr.,
Chemical Department.

MDP:BRM

APPLETON v. WATSON
Civil Action 3200-54

Plaintiff's Exhibit ________

COMPARISON CHART FOR CLAIM 16

Claim Elements	Application Drawings	Williams 321,166	Keil 489,150	Gover Br. 23,369	Tornblom 2,392,202	Baker 2,447,048	Bissell et al. 2,476,352	Appleton Co. AA-51 Series (Drawing 64039)
PREAMBLE "in an electric lighting fixture	Yes	No	Yes	No	Yes	No	Yes	Yes
an explosionproof fixture casing ennlosed partially by a solid impervious wall	Yes; 14,15,18,38	No	No	No	Yes; 20,40,22	Possibly Yes; 17,18,16	Yes; 31,32,38,44, 41	Yes; 18,30,12
having a detachable portion	Yes; 38	Yes; G	Yes; m	Yes; C	Yes; 40	Yes; 17	Yes; 41	Yes; 30 detaches from 18
and [enclosed] partiallyby a rigid pervious wall of porous metal	Yes; 79	No	No	No	No	No; porous metal 15 is inside the casing	No	Yes; 26
[which is] integral with said detachable portion of said impervious wall."	Yes; 79 integral with 38	No	No	No	No	No	No	Yes; 26 integral with 30

APPLETON v. WATSON
Civil Action 3200-54

Plaintiff's Exhibit ______

COMPARISON CHART FOR CLAIM 18

Claim Elements	Application Drawings	Williams 321,166	Keil 489,150	Gover Br. 23,369	Tornblom 2,392,202	Baker 2,447,048	Bissell et al. 2,476,352
PREAMBLE "In an electric lighting fixture, the combination of	Yes	No	Yes ~~No~~	No	Yes	No	Yes
an explosionproof fixture casing having a solid impervious wall	Yes; 14,15,18	No	No	No	Yes; 20	Possibly Yes; 1617, 18	Yes; 38
with an access aperture therein	Yes; 39	Yes	---	---	Yes	No	Yes; 40
and a handhole plug	Yes; 38	Yes; G	---	---	Yes; 40	No	Yes; 41
having a seating surface of solid wall material	Yes	Yes	---	---	---	No	---
[which is] integrally bonded to a rigid sintered metallic panel of substantial thickness."	Yes; 79 bonded to 39	No	No	No	No	No	No

APPLETON v. WATS
Civil Action 3200-54

Plaintiff's Exhibit ______

COMPARISON CHART FOR CLAIM 19

Claim Elements	Application Drawings	Williams 321,166	Keil 489,150	Gover Br. 23,369	Tornblom 2392,202	Baker 2,447,048	Bissell et al. 2,476,352	Appleton Co. AA-51 Series (Drawing 64039)
PREAMBLE "An electric lighting fixture characterized by	Yes	No	Yes	No	Yes	No	Yes	Yes
an explosionproof casing	Yes; 14, 15, 18, 38	No	No	No	Yes; 20, 40, 22	Possibly Yes; 17, 18, 16	Yes; 31, 32, 38, 44, 41	Yes; 18, 30, 12
having a threadedly detachable solid wall portion	Yes; 38	Yes; G or A	Yes; m	Yes; B	Yes; 40	No	Yes; 41	Yes; 30 unscrews from 18 at threads 25
[which is] integrally bonded to a rigid sintered metallic wall panel."	Yes; 79	No	No	No	No	No	No	Yes; 26 integrally bonded to 30

APPLETON v. WAT N
Civil Action 3200-54

Plaintiff's Exhibit ________

COMPARISON CHART FOR CLAIM 20

Claim Elements	Application Drawings	Williams 321,166	Keil 489,150	Gover Br.23,369	Tornblom 2,392,202	Baker 2,447,048	Bissell et al. 2,476,352
PREAMBLE "In an explosionproof lighting fixture	Yes	No	No	No	Yes	No	Yes
PREAMBLE having an internally partitioned casing	Yes	No	No	No	Yes	Yes	Yes
PREAMBLE including a pair of chambers sealed each from the other against the passage of gas therebetween,	Yes; 50,51	No	No	No	Yes	No	Yes
PREAMBLE said chambers having electrical components therein	Yes	No	---	---	Yes	No	Yes
PREAMBLE and [the chambers having] access openings to the exterior of said fixture, the combination comprising	Yes	---	---	---	Yes	No	Yes
closure members for said access openings,	Yes;38,58	---	---	---	Yes	No	Yes
and rigid porous metallic panels unitary with said closure members,	Yes;79	No	No	No	No	---	No
said panels being adapted to dissipate gas pressure resulting from internal explosions within said chambers while arresting the passage of flame therefrom.	Yes	No	No	No	No	No	No

APPLETON v. WATSON
Civil Action 3200-5

Plaintiff's Exhibit ________

COMPARISON CHART FOR CLAIM 21

Claim Elements	Application Drawings	Williams 321,166	Keil 489,150	Gover Br. 23,369	Tornblom 2,392,202	Baker 2,447,048	Bissell et al. 2,476,352
PREAMBLE "In an explosionproof lighting fixture	Yes	No	No	No	Yes	No	Yes
PREAMBLE having a terminal chamber and a lamp chamber sealed each from the other, the combination of	Yes; 50, 51	No	No	No	Yes	No	Yes
a casing having a solid walled portion defining at least a part of each said chamber,	Yes; 15	---	---	---	Yes; 20	---	Yes; 20, 32, 31
a detachable casing element defining another part of each said chamber,	Yes; 38, 58	---	---	---	Yes; 40	---	Yes; 35, 24
and a rigid heat resistant porous metallic panel	Yes	No	No	No	No	Yes; 15	No
[which is] integral with each said detachable casing element	Yes	No	No	No	No	No	No
for flameless venting of internal gas pressure from either of said chambers to the exterior of said fixture	Yes	No	No	No	No	No	No

APPLETON v. WATSC
Civil Action 3200-54
Plaintiff's Exhibit ________

COMPARISON CHART FOR CLAIM 22

Claim Elements	Application Drawings	Williams 321,166	Keil 489,166	Gover Br.23,369	Tornblom 2,392,202	Baker 2,447,048	Bissell et al. 2,476,352
PREAMBLE "An explosionproof fluorescent lighting fixture comprising, in combination,	Yes	No	No	No	Yes	No	Yes
a pair of spaced apart end casings	Yes; 14,15	Yes; D,A	Yes; h,m	No	Yes; 20	Yes; 17,18	Yes; 38
[which are] connected by means of a hollow strut	Yes; 16	No	No	No	No	No	Yes; 44
and [which are connected by] a glass protective tube,	Yes; 18	No	Yes; in lieu of g	No	Yes; 22	No	Yes; 31
internal partitions in one of said end casings	Yes	No	No	No	Yes	No	No
defining a terminal chamber	Yes; 50	No	No	No	Yes; for 32	No	No
as well as a lamp chamber	Yes; 51	No	---	No	Yes; for 24	No	Yes
and a ballast chamber,	Yes; 52	No	No	No	No	No	No
said partitions also defining sealing wells between said terminal chamber and said other chambers,	Yes; 72, 76	No	No	No	Yes	No	No
a plurality of gas seal plugs disposed in respective ones of said sealing wells to isolate said terminal chamber from the potentially arcing portions of said fixture in said other chambers,	Yes; 79,78	No	No	No	Yes	No	No
and casing wall elements detachably secured to said one casing,	Yes; 38,58,70	Yes; G	No	No	Yes, 40	No	Yes;35
said elements including rigid porous metallic plates for explosionproof venting of any one of said chambers to the exterior of said fixture."	Yes; 79	No	No	No	No	No	No

APPLETON v. WATSON
Civil Action 3200-54

Plaintiff's Exhibit ________

COMPARISON CHART FOR CLAIM 23

Claim Elements	Application Drawings	Williams 321,166	Keil 489,150	Gover Br. 23,369	Tornblom 2,392,202	Baker 2,447,048	Bissell et al. 2,476,352
PREAMBLE "In an explosionproof fluorescent lighting fixture, the combination of	Yes	No	No	No	Yes	No	Yes
a first end casing	Yes; 15	Yes; A,B	Yes; h	Yes; C	Yes; 20	Yes; 17	Yes; 32,20
having internal partition walls	Yes	No	No	No	Yes	No	Yes; near 26,27
defining terminal and lamp and ballast chambers	Yes; 50,51,52	No	No	No	No	No	No terminal chamber
with connecting passages therebetween,	Yes; 71,76	No	No	No	No	No	---
gas seal barriers disposed between said terminal chamber and said lamp chamber but not between said lamp chamber and said ballast chamber,	Yes; 74, 78	No	No	No	No	No	No/ seal between lamp and ballast chamber
said first end casing having access apertures opening from said terminal chamber and said lamp chamber to the exterior of said fixture,	Yes	No	No	No	Yes	No	Yes
a second end casing	Yes; 14	Yes; D	Yes;d'	Yes;B	Yes;20	Yes;18	Yes;38
having lamp and switch chambers in direct communication with each other,	Yes; 41,42	No	No	No; no switch chamber	No	No	No; no switch chamber
said second casing having access apertures opening from said lamp chamber to the exterior of said fixture,	Yes, 39	No	No	No	Yes	No	Yes
protective glass tubes connecting the lamp chambers of said first and second end casings,	Yes; 18	No	Yes, in lieu of G	No	Yes; 22	No	Yes; 31
detachable plugs for closing the access apertures of the respective chambers,	Yes; 38,58,70	No	No	No	Yes; 39,40	No	Yes; 41,35,24
each said plug having a rigid porous metallic wall integral therewith for explosionproof venting of internal gas pressure from any one of said chambers to the exterior of said fixture."	Yes; 79	No	No	No	No	No	No

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SALES FIGURES ON EXPLOSIONPROOF X-RAY FILM ILLUMINATORS AND AA51 LIGHTING FIXTURES

			AA-51 - Incandescent Explosionproof Fixture				
		A-182D - Film Illuminator Explosionproof	AAP1075G (100 watts)	AAP1575G (150 watts)	AAP2075G (200 watts)	AAP5075G (500 watts)	Grand Totals
1951	Units Sold	1,139					1,139
	Average Price Per Complete Fixture for Each Unit Sold	$ 130.17					
	Total Value Fixture Sales	$148,263.63					$148,263.63
1952	Units Sold	877					877
	Average Price Per Complete Fixture for Each Unit Sold	$ 136.55					
	Total Value Fixture Sales	$119,754.35					$119,754.35
1953	Units Sold	1,178	911	1,500	4,475	747	8,811
	Average Price Per Complete Fixture for Each Unit Sold	$ 135.44	$ 15.80	$ 15.80	$ 22.64	$ 37.36	
	Total Value Fixture Sales	$159.548.32	$14,393.80	$23,700.00	$101,314.00	$27,907.92	$326,864.04
1954	Units Sold	837	1,145	1,972	5,230	1,074	10,258
	Average Price Per Complete Fixture for Each Unit Sold	$ 135.44	$ 14.23	$ 14.23	$ 20.42	$ 33.58	
	Total Value Fixture Sales	$113,363.28	$16,293.35	$28,061.56	$106,796.60	$36,064.92	$300,579.71
1955	Units Sold	924	1,191	2,514	5,784	918	11,331
	Average Price Per Complete Fixture for Each Unit Sold	$ 135.44	$ 14.23	$ 14.23	$ 20.42	$ 33.58	
	Total Value Fixture Sales	$125,146.56	$16,947.93	$35,774.22	$118,109.28	$30,826.44	$326,804.43
1956 (First Seven Months)	Units Sold	322	1,199	1,572	4,652	1,156	8,901
	Average Price Per Complete Fixture for Each Unit Sold	$ 161.72	$ 17.00	$ 17.00	$ 24.28	$ 36.32	
	Total Value Fixture Sales	$52,073.84	$20,383.00	$26,724.00	$112,950.56	$41,985.92	$254,117.32
	Fixtures Sold	5,277	4,446	7,558	20,141	3,895	41,317
	Total Value Dollar Sales	$718,149.98	$68,018.08	$114,259.78	$439,170.44	$136,785.20	$1,476,383.48

SALES FIGURES ON EXPLOSIONPROOF X-RAY FILM ILLUMINATORS AND AA51 LIGHTING FIXTURE UNITS

			AA-51 Series - Incandescent Explosionproof Unit				
		A-182G-Film Illuminator Explosionproof Unit	AAU-1 (100 watts)	AAU-15 (150 watts)	AAU-2 (200 watts)	AAU-5 (500 watts)	Grand Totals
1961	Units Sold	1,139					1,139
	Average Price Per Unit	$92.19					
	Total Value Unit Sales	$105,004.41					$ 105,004.41
1962	Units Sold	877					877
	Average Price Per Unit	$96.70					
	Total Value Unit Sales	$84, 805.90					$ 84,805.90
1963	Units Sold	1,178	911	1,500	4,475	747	8,811
	Average Price Per Unit	$81.60	$12.48	$12.48	$18.96	$32.44	
	Total Value Unit Sales	$ 96,124.80	$ 11,369.28	$ 18,720.00	$ 84,848.00	$ 24,232.68	$ 235,292.76
1964	Units Sold	837	1,145	1,972	5,230	1,074	10,258
	Average Price Per Unit	$81.60	$11.32	$1132	$17.18	$29.20	
	Total Value Unit Sales	$ 68,299.20	$ 12,961.40	$ 22,323.04	$ 89,851.40	$ 31,360.80	$ 224,795.84
1965	Units Sold	924	1,191	2,514	5,784	918	11,331
	Average Price Per Unit	$81.60	$11.32	$11.32	$17.18	$29.20	
	Total Value Unit Sales	$ 75,398.40	$ 13,482.12	$ 28,458.48	$ 99,369.12	$ 26,805.60	$ 243,513.72
1966 (First Seven Months)	Units Sold	322	1,199	1,572	4,652	1,156	8,901
	Average Price Per Unit	$96.20	$13.52	$13.52	$20.44	$30.73	
	Total Value Unit Sales	$ 30,976.40	$ 16,210.48	$ 21,253.44	$ 95,086.88	$ 35,523.88	$ 199,051.08
	Units Sold - All Years	5,277	4,446	7,558	20,141	3,895	41,317
	Total Value Dollar Sales	$ 460,609.11	$ 54,023.28	$ 90,754.96	$369,153.40	$117,922.96	$1,092,463.71

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Filed Feb. 7, 1957

Findings of Fact

1. This is an action under Title 35 of the United States Code, Section 145, in which the plaintiffs, Appleton Electric Company and Nils A. Tornblom, sought to have the Court authorize the allowance of claims 14, 15, 16, 18 through 23 and 25 of Nils A. Tornblom's application for patent Serial No. 789,444. No claims in the application were allowed by the Patent Office. Nils A. Tornblom, having died since the commencement of the action and not being a necessary party to the action, he was removed as a party plaintiff upon motion of the plaintiff, Appleton Electric Company. Claims 14, 15 and 25 were withdrawn from consideration by the Court by the plaintiff at the trial hearing.

2. The claims involved in the proceeding relate to an explosion proof electric lighting fixture adapted for use in locations where the atmosphere is apt to contain inflammable or explosive gases, vapors or dust. As described in claims 18 and 19, the lighting fixture is characterized by the provision, in the otherwise impervious wall 166 of the fixture, of a detachable portion comprising a rigid, sintered metallic wall panel. In the remaining claims, the detachable portion is defined as comprising a rigid, porous, metallic plate, panel or wall. The fixture is, thus, provided with means to dissipate, without permitting the leakage of any flame, internal gas pressure resulting, for example, from ignition of an explosive mixture including gases filtering into the fixture from the surrounding outside atmosphere.

3. The Williams patent No. 321,166 discloses a safety lamp for use in places where there may be explosive gas, in which the flame of the lamp is enclosed within a wire gauze cylinder. Additional protection is afforded by a

wire gauze diaphragm held in place in an opening in the top of the lamp casing by a screw threaded gland.

4. The Keil patent No. 489,150 discloses an electric lantern in which an incandescent bulb and its socket are enclosed within a casing having a wall which comprises, in part, a wire gauze cylinder, which is said by the patent to prevent the ignition of explosive gases in the atmosphere surrounding the lamp if the bulb should be broken.

5. The Tornblom patent No. 2,392,202 and the Bissell et al. patent No. 2,476,352 disclose electric lighting fixtures adapted for use in hazardous locations, the operating parts of the lamps being disposed in compartments sealed mechanically from each other and from the outside atmosphere. The casings of the fixtures of both patents are provided with access openings having screw-threaded impervious closures.

167 6. The Baker patent No. 2,447,048 discloses a backfire arrester for use in combustible gas systems, such as blowpipes, the arrester comprising a casing mounted in the gas line and in which is mounted, in the gas flow path, a porous disk made by sintering together bronze metal particles.

7. The British patent No. 23,369 issued in 1897 to Gover et al. discloses an electric fuse device, adapted for use near combustible materials or gases, the casing of the fuse being provided with an opening in which is secured a panel of wire gauze or other pervious material which will permit the exit of gases under pressure but will prevent the communication of flame to the exterior of the casing.

8. In view of the Keil patent disclosure, the provision of an electric lamp fixture with a casing composed of both impervious parts and a rigid pervious wall of porous metal would have been obvious at the time the casing invention was made to a person having ordinary skill in the electric lamp fixture art. Claim 16, therefore, does not define invention.

9. In view of the Baker patent disclosure, the use of a porous sintered metal panel in a closure in the wall of an electric lamp fixture would have been obvious at the time such panel invention was made to a person having ordinary skill in the electric lamp fixture art, particularly in view of the disclosures in the patent to Gover, Williams or Keil. Claims 18 and 19, therefore, do not define invention.

10. To provide the electric lamp casings of the Tornblom or Bissell et al. patents with closures embodying a rigid porous metallic panel would have been obvious at
the time the casing invention was made to a person
168 having ordinary skill in the electric lamp fixture
art in view of the disclosures of the patents to
Baker, Williams or Keil. Claims 20 through 23 do not, therefore, define invention.

11. Claims 16 and 18 through 23 are unpatentable in view of the prior art.

Conclusion of Law

1. The plaintiff is not entitled to a patent containing any of claims 14, 15, 16, 18 through 23 and 25 of application Serial No. 789,444.

2. The complaint should be dismissed.

ALEXANDER HOLTZOFF, *Judge*

February 7, 1957

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Filed Feb. 7, 1957

Judgment

This action came on to be heard at this term, and thereupon upon consideration thereof, it is this 7 day of February, 1956

ADJUDGED that the complaint be and it is hereby dismissed, with costs against plaintiff.

ALEXANDER HOLTZOFF, *Judge*

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Feb. 18, 1957, Harry M. Hull, Clerk

Motion

Now COMES plaintiff, Appleton Electric Company, and moves the Court under the provisions of Rule 52(b) of the Federal Rules of Civil Procedure to amend its findings of fact and conclusions of law, entered February 7, 1957, and to enter additional findings of fact in the following particulars and for the reasons stated:

> 1. Amend Finding of Fact No. 1 by changing the period (i) to a comma (,) and inserting —filed December 3, 1947 and entitled "Explosion Proof Light Fixture of the Vented Type."— for the purpose of making this finding complete.
>
> 2. Delete Findings of Fact Nos. 2 to 10, inclusive, on the ground that each and all of these Findings of Fact are conclusions of law, being solely interpretations of written documents.
>
> 3. Delete Findings of Fact No. 11 on the ground that it is a conclusion of law, being an interpretation of written claims of patent application in suit, and a legal conclusion as to patentability.
>
> 4. Supplement the findings of fact by making the following additional findings in either of their alternative forms. The following findings are on
> 177 factual issues and necessary to determination
> of the ultimate conclusions of patentability and right of plaintiff to a patent. We urge the findings be made in the first listed alternative form in order to

conform the clear and conclusive evidence in the record carrying a thorough conviction:

1. Locations where the atmosphere is apt to contain inflammable or explosive gases, vapors or dusts (are) (are not) commonly known as hazardous locations in the field of electric lighting. In such locations, the inflammable or explosive atmosphere (may) (may not) be ignited by an electric spark in an electric lighting fixture. Electric sparks in electric lighting fixtures (may and do) (cannot and do not) occur. Even in encased electric lighting fixtures, the inflammable or explosive gases, vapors or dusts (tend to and do) (do not) seep into and collect inside the casing of electric lighting fixtures.

2. Prior to December 3, 1947, the electric lighting fixtures adapted for use in hazardous locations where the atmosphere is apt to contain inflammable and explosive mixtures (were) (were not) of two types; a heavy walled casing type of sufficient strength to contain an internal explosion without rupture and a pressurized type containing an inert gas under pressure to prevent flow or seepage of explosive mixtures into the fixture and hence to prevent an explosion.

3. The electric lighting fixture disclosed in the Tornblom application (does not) (does) prevent an explosion within the casing of the fixture, and
178 (does not) (does) contain an internal explosion within the casing. There (is) (is not) uncontradicted testimony that the fixture described in the Tornblom application permits free passage of explosive gaseous mixtures into the casing of the fixture, and that should explosion occur within the casing, the expanding gases resulting from the explosion (pass) (do not pass) readily out of the casing into the surrounding atmosphere without

spreading the explosion or flame beyond the interior of the casing of the fixture.

4. The record establishes that the Tornblom application (is) (is not) correct in its factual assertion that the structure which provides the operation of the fixture described in the application is:

"a metallic casting having relatively heavy walls" and

"Each of the disks 79 [described in the application as a rigid porous metallic disk or plate] is of appropriate thickness to withstand the sharp rise in pressure within the fixture incident to the explosion due, for example, to arcing in one or more of its various electrical components".
and in operation it (is) (is not) correct that:

"Such pressure can be quickly equalized with that of the surrounding atmosphere via a plurality of tortuous, flame arresting paths defined within the porous structure of the disk metal itself."

5. A fixture made in accordance with the description of the Tornblom application (has) (has not) been approved by Underwriters Laboratories, Inc., for use in hazardous locations.

179 Electric lighting fixtures having the elements described in the application claims in issue (are) (are not) lighter in weight and (can) (cannot) be made of less costly materials of manufacture than prior available explosionproof lighting fixtures. In the fixe hundred watt size of incandescent electric lighting fixture having the elements described in the application claims in issue, the weight (is) (is not) reduced from thirty to nineteen pounds, the thickness of the glass globe (is) (is not) reduced from three-quarters of an inch to

nine-thirty seconds of an inch and internal pressures from explosion (are) (are not) reduced from 96 pounds per square inch to 1.6 pounds per square inch, as compared to the heavy wall type fixture. The prior type of pressurized electric lighting fixture (requires) (does not require) in addition to the fixture itself an auxiliary inert gas supply mechanism to insure safe operation.

7. Electric lighting fixtures having the elements described in the application claims in issue (have) (have not) been manufactured and sold by plaintiff, Appleton Electric Company. In the past fixe years and seven months, plaintiff (has) (has not) sold such fixtures having a sales value of the electrical units alone $1,092,463 and for the complete fixture of which the electrical units are a part of $1,476,383.

8. There (is) (is not) credible undisputed testimony in the record of this action that "a rigid pervious wall of porous metal" as recited in claim 16 has a particular meaning to one skilled in the art,
and is a metal so formed as to have a great
180 number of small zigzag passages extending
through the thickness of the metal. The
"wire gauze" referred to in the disclosures of the Williams patent No. 321,166, Keil patent No. 489,150, and British Gover patent No. 23,369, (is) (is not) in this art "a rigid pervious wall of porous metal."

9. The lamp disclosed in the Williams patent No. 321,166, issued June 30, 1885 (is) (is not) commonly designated as the Davy lamp. The evidence at trial establishes that it (is) (is not) essential to safe use of either the lamp of the Williams patent disclosure, or the Davy lamp, than an open flame continuously burn explosive gases as soon as they enter the lamp through the wire gauze. If a spark

or open flame occurs in an unlighted Williams or Davy lamp after it is filled with explosive gases, an explosion (is) (is not) likely to occur which (will) (will not) force hot flames through the gauze into the surrounding atmosphere and ignite any explosive gases there present.

10. There is uncontradicted evidence and the Court finds that the lantern disclosed in the Keil patent No. 489,150 (will not) (will) prevent ignition of explosive gases in the atmosphere if the lantern is placed in such an atmosphere of explosive gases and an electrical spark occurs within the lantern. The wire gauze body "g" and wire end disk "g′" (will) (will not) permit explosive gases to accumulate within the lantern, which, if ignited by an electric spark or arc (will) (will not) force hot flames through the wire gauze to the surrounding atmosphere.
181 The Court finds the lantern disclosed by Keil to be (unsafe) (safe) for an electric lighting fixture in hazardous locations.

11. Based on uncontradicted testimony, the Court finds that the device disclosed in the British patent No. 23,369, issued in 1897 to Gover, (is) (is not) inoperative to prevent explosion of gas within the casing C and (is) (is not) inoperative to prevent ignition of explosive gases in the surrounding atmosphere should an explosion occur within the casing. The Gover device is (unsafe) (safe) in hazardous locations.

12. The Court finds that the fixtures disclosed in Tornblom patent No. 2,392,202 and Bissell et al patent No. 2,476,352 (are) (are not) of the heavy wall type which contain an internal explosion by the strength of the walls. The casings of the fixtures disclosed in these patents (have) (do not

have) compartments mechanically sealed from each other and from the outside atmosphere, and (have) (do not have) entrance openings sealed with solid impervious caps.

13. There is uncontradicted evidence, and the Court finds, that the device described in Baker patent No. 2,447,048, which issued August 17, 1948 subsequent to the filing date of the Tornblom application in suit, (will) (will not) arrest the passage of flame in a blowpipe system. The record also shows and the Court finds that the device disclosed in the Baker patent (does not) (does) function to reduce pressures within a casing and (has not) (has) been manufactured and sold.

182 14. The Court finds that the disclosures of the Williams, Keil, and British Gover patents have been available to the public for fifty years and more prior to the filing of the Tornblom application in suit, and that there (is no) (is) evidence that anyone in the interim prior to Tornblom suggested the combination of a rigid porous sintered metal panel and an impervious casing wall of an explosionproof electric lighting fixture.

15. The uncontradicted evidence establishes that those acquainted with the Baker patent (did not) (did) suggest the use of its disclosure for electric lighting fixtures or for anything other than a flame arrester in a blowpipe, even though such persons (did) (did not) have the problem of preventing explosions in hazardous locations due to spark or flame.

16. The electric lighting fixtures described in the Tornblom 2,392,202 and Bissell et al patents operate on a principle which is (entirely different from) (the same as) the principle of the electric lighting fixture described in the Tornblom application in

suit. In the former fixtures an explosion (is) (is not) contained within the fixture by sealed joints and heavy walls, and in the latter fixture an explosion (is) (is not) permitted to dissipate itself almost instantly into the surrounding atmosphere.

5. Amend the Conclusions of Law by substituting the following in which plaintiff urges the first alternative form be concluded as a matter of law:

1. Claims 16 and 18 to 23, inclusive, (patentably) (do not patentably) distinguish over the prior art of record in this case.

183 2. The combinations defined by claims 16 and 18 to 23, inclusive, (embody) (do not embody) patentable invention within the meaning of Title 35, United States Code.

3. The plaintiff (is) (is not) entitled to a patent containing claims 16 and 18 to 23, inclusive, of application Serial No. 789,444.

Respectfully submitted,

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195 [Filed Feb 28 1957]

Defendant's Opposition to Plaintiff's Motion Under Rule 52(b) F. R. C. P.

Now comes the defendant, Commissioner of Patents, and opposes the plaintiff's Motion under Rule 52(b) under the Rules of Civil Procedure for the following reasons:

1. The proposed amendment of Finding of Fact No. 1 filed by the Court on February 7, 1957, is unnecessary in order to sufficiently identify the application for patent in issue.

2. Findings of Fact 2 to 10 inclusive, filed by the Court should not be deleted since they are in proper form as Findings of Fact under prevailing authority.

3. Finding of Fact No. 11 filed by the Court is in proper form as a Finding of Fact under prevailing authority and it should not therefore be in the form of a Conclusion of Law.

4. The Findings of Fact proposed by the plaintiff in its motion should not be adopted by the Court in either of the alternative forms since they (a) do not constitute ultimate facts which it was necessary for the Court to find in order to reach a decision or (b) relate to subject matter adequately covered by the Findings filed by the Court.

5. Plaintiff's proposed Conclusions of Law relate to matters adequately dealt with in the Findings of Facts and Conclusions of Law filed by the Court.

Respectfully submitted,

C. V. MOORE,
Solicitor, U. S. Patent Office,
Attorney for Defendant.

February 28, 1957

148 Washington, D. C.,
Friday, March 8, 1957.

149 **Proceedings**

The Deputy Clerk: *Appleton Electric Company* v. *Watson.*

Mr. Osann: Your Honor, this is a motion under rule 52(b) to amend the findings of fact and conclusions of law entered in this case on February 7, 1957, and to enter certain additional findings of fact.

The Court: Why didn't you present them at the time counsel for the Patent Office presented his findings? That would have been the proper time, would it not?

Mr. Osann: We did present substantially these findings at that time, Your Honor.

The Court: I see. What you are seeking to do, then, is to re-argue the matter?

Mr. Osann: I do not propose to take a great deal of time.

The Court: Very well. The Court will hear you. I just want to understand what you were trying to do. I thought this was something new. You may proceed.

Mr. Osann: At the time that our proposal was presented earlier in the case we did not have the benefit of the record. What we have done now is to come in with these proposed findings and accompany them with a supporting memorandum which pinpoints those portions of the record which we feel supports the position we have taken.

150 As to the findings that were entered in this case there are two objections that we have to present to the Court; first, the so-called findings of fact which were entered are more properly conclusions of law since they merely state or construe patent documents, namely, certain patent references which were relied upon by the Patent Office. Additionally, there are material issues of fact which were not touched by those findings. We think that these other issues of fact are necessary to a determination of the case.

The additional findings of fact that we submit for Your Honor's consideration have been grouped in our supporting memorandum into several categories. Proposed findings of fact numbered one to five, inclusive, we proposed to substitute for finding of fact number two which the Court entered. These proposed findings of fact, first of all, deal with the nature of the hazardous location for which the invention of the application in suit was designed.

Proposed finding of fact number two relates to the two basic types of explosion-proof lighting fixtures, namely, the heavy wall fixture and the inert gas-filled fixtures which were the previous approaches taken by the art to solution of the explosion-proof electric lighting fixture problem.

Proposed finding number three relates to the operation of the fixture disclosed in the Tornblom
151 application in suit.

Proposed finding number four relates to the operation of an important and crucial element in the application. Proposed finding number five relates to the technical acceptance or approval by Underwriters' Laboratories of fixtures embodying the invention of the application in suit.

We feel as to finding number one the transcript supports the first alternative which we have given at pages 22 through 25 in the transcript. Proposed finding two, we feel, is supported as to the first alternative by pages 25 through 29 of the transcript. We feel proposed finding of fact number three is supported by the testimony at pages 50 through 54, and by Plaintiff's Exhibit 6. We feel proposed finding number four is supported as to the first alternative by pages 37, 38, 47, and 51 through 55, and Plaintiff's Exhibit 6. Proposed finding of fact number five as to the first alternative is supported by the transcript at page 35 and Plaintiff's Exhibit 6.

Proposed findings of fact numbers six and seven deal with the manufacturing advances and commercial success of the device of the application in suit as to the first alternative. We feel the proposed finding six is supported in the transcript at pages 111, 113, 112, 110, and 26 and 27.

Proposed finding of fact number seven as to the first
152 alternative is supported by the transcript at pages
33, 104, 119, 120, and by Plaintiff's Exhibit Nos. 5,
15, 16, 22, and 23.

Proposed finding of fact number eight relates to the meaning of terminology used in the application in suit with respect to its meaning to one skilled in the art. It is an appropriate issue of fact and the first alternative of proposed finding number eight, we believe, is clearly supported by the transcript of trial at pages 68, 71, and page 95.

In lieu of findings of fact numbers three to seven which the Court has entered we urge that proposed findings of fact numbers 9 to 13, inclusive, be substituted or entered additionally. This group of proposed findings deals with the inoperativeness of the devices of the references relied upon by the Patent Office.

We submit that there is clear and convincing evidence in the record—uncontradicted and unimpeached testimony—which supports the first alternative of these proposed findings 9 to 13, inclusive.

Proposed finding number nine relates to operation of the device of the Williams patent and is supported as to the first alternative by the transcript at page 67, and by Plaintiff's Exhibit Nos. 9 and 13.

Proposed finding ten is supported as to the first
153 alternative by the——

The Court: Those page references are all in your memorandum, are they not?

Mr. Osann: Yes. I thought it might be helpful to the Court if I would point them out here.

The Court: Do not repeat them. You are taking considerable time for a motion such as this.

Mr. Osann: Your Honor, I could save time if I pointed out to you that the remaining points that I had intended to cover here are covered in our supporting memorandum.

The Court: No. You may state your points, but page references given are really of no particular help. I want you to state your points orally.

Mr. Osann: We think that the subject matter of proposed findings 9 to 13 is extremely important, especially as to this fact issue of inoperativeness for the purpose of making an explosion-proof electric lighting fixture.

We submit that there is clear and convincing evidence in the record—uncontradicted and unimpeached testimony—which compels a finding on the first alternative which we have given for proposed findings 9 to 13, inclusive.

Proposed findings of fact numbers 14 to 16, inclusive, relate to the availability to the public of the disclosures
of the Williams, Keil, and Govers patents, and
154 to lack of proof of any use of them for the purpose
of the device of the application in suit. We feel
that the first alternative form of each of those proposed findings is correct.

I might add that proposed finding number 15 relates to the lack of suggestion or use of the disclosure of the Baker patent in relation to electric lighting fixtures. Proposed finding number 16 relates to the entirely different principle of operation of the lighting fixtures described in Tornblom patent 2,392,202, and Bissell, et al., patent.

Turning now to the proposed conclusions of law, we have submitted three of them which we feel logically follows if Your Honor sees fit to find as on the first alternative of our proposed findings of fact.

Mr. Cochran: If Your Honor please, on behalf of the defendant we submit that the findings already on file are sufficient and that the proposed findings are either unnecessary or are not supported by the record. Your Honor has already considered the proposed findings essentially in this form, orally, and stated you believe the government's findings are sufficient.

We submit that you should adhere to that decision. We believe there is no basis in the authorities—either those cited by the plaintiff or any other—for designating findings on file numbered 2 to 11 as improper findings 155 of fact. The plaintiff's authorities, which he cited in support of that view, stand, it seems to us, for the proposition that the interpretation of claims in a patent which is in litigation to determine the question of infringement might properly be reviewed by an appellate court as involving a question of law. That would seem to have no bearing and propriety of determining a summary of what a patent actually discloses.

The Court: I want to say this, that if those findings are really conclusions of law that point is well taken; then there is no place for a patent expert to testify under oath because then everything that is ordinarily elicited from patent experts on the witness stand is a question of law and should be argued by counsel. I am sure no member of the Patent Bar would want to take that position.

Mr. Cochran: Then the question as to whether a finding of patentable invention or lack of invention——

The Court: I think whether an invention is patentable or not involves mixed questions of law and fact, and not merely a question of law. I do not think you need labor that point. For instance, whether it involves the application of the inventive faculty is all a question of fact, and not a question of law.

Mr. Cochran: We believed proposed findings 1 to 16 are unnecessary to a court's determination of the case, 156 or are not properly supported by the record. We believe findings are not intended to constitute a review of all of the factual matter which the Court could find, but rather to constitute the ultimate facts which were necessary for the Court to arrive at in order to make a determination.

Proposed findings 9 to 13, which relate to the alleged inoperativeness of the reference devices, were based primarily on testimony of a single witness, which we believe would be insufficient to overcome the presumption that the patent devices worked as they were intended.

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Oral Ruling of the Court

The Court: The Court is of the opinion that in the guise of a motion to amend findings what plaintiff's counsel is actually trying to do is to re-argue and secure a re-hearing on the merits of the case. The Court feels that the findings as signed carries out the intent of the Court in its decision.

The motion is denied.

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Order

This case came on to be heard after trial on Motion by the Plaintiff to amend the Findings of Fact and Conclusions of Law filed by the Court and to enter additional Findings of Fact, and upon consideration thereof, it is this 25 day of March, 1957

ORDERED that the said Motion be and it is hereby denied.

ALEXANDER HOLTZOFF, *Judge.*

March 25, 1957

201 [Filed May 24, 1957.]

Notice of Appeal

Notice is hereby given, pursuant to Rule 73, F.R.C.P., that the above-named plaintiff, Appleton Electric Company, hereby appeals to the United States Court of Appeals for the District of Columbia Circuit from the Final Judgment entered in this action on the 7th day of February, 1957, adjudging that the complaint be dismissed.

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BRIEF FOR APPELLANT

IN THE

United States Court of Appeals

DISTRICT OF COLUMBIA CIRCUIT

United States Court of Appeals
For the
District of Columbia Circuit
FILED AUG 14 1957
Joseph W. Stewart
CLERK

Appeal No. 13,985

APPLETON ELECTRIC COMPANY, *Appellant*,

v.

ROBERT C. WATSON, Commissioner of Patents, *Appellee.*

Appeal From the Judgment of the United States District Court for the District of Columbia

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PRESS OF BYRON S. ADAMS, WASHINGTON, D. C.

STATEMENT OF QUESTIONS

1. Where a trial court on the face of the record demonstrates, in its haste to be rid of a case, a lack of understanding of the basic facts which are not disputed on the record, and avoids making findings on issues of material and relevant facts for the stated reason "I am not going to weaken my ruling by diluting it with your proposed findings", should not this Court make its own determination of relevant, material basic facts which are undisputed and corroborated by the record, and find error in ultimate conclusions unsupportable by such basic facts?

2. Should not prior art disclosures, conclusively shown by the record to be inoperative and dangerous for the object an applicant for patent seeks to achieve, be held inapplicable to deny the applicant a patent for a device of his own origin which pre-eminently achieves that objective?

3. Are the facts that an applicant for patent has contributed an explosionproof electric lighting fixture unique in the history of the industry—operating on a new principle proven safe, and embodied in a lower cost, lighter, smaller, thinner-walled and more practical form than prior devices —necessarily relevant and compelling of a conclusion that the contribution was "not obvious" and is patentable under the provisions of Section 103, Title 35, U.S.C.?

4. Is the phrase "a rigid pervious wall of porous metal" used in the patent application and a claim in issue to be necessarily interpreted according to the meaning it has to one skilled in the art or in the context of the specification, so that it cannot be validly construed to include a wire gauze or screen?

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IN THE

United States Court of Appeals

DISTRICT OF COLUMBIA CIRCUIT

Appeal No. 13,985

APPLETON ELECTRIC COMPANY, *Appellant*,

v.

ROBERT C. WATSON, Commissioner of Patents, *Appellee*.

Appeal From the Judgment of the United States District Court for the District of Columbia

BRIEF FOR APPELLANT

JURISDICTIONAL STATEMENT

This is a civil action commenced July 27, 1954 in the District Court for the District of Columbia by complaint (App. 1)* filed by Nils A. Tornblom, applicant for United States Letters Patent, and his assignee, Appleton Electric Company, plaintiff-appellant here. Defendant-appellee is Robert C. Watson, United States Commissioner of Patents. Tornblom, having died subsequent to commencement of the action, was dismissed as a non-essential party plaintiff.

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* References to the Joint Appendix are designated "App."

The complaint herein is based on the jurisdictional provisions of Title 35, United States Code, Section 145 (formerly R.S. 4915), and seeks judgment that plaintiff is entitled to Letters Patent containing claims numbered 14, 15, 16, 18-23 and 25 in application Serial No. 789,444 (App. 6), filed by Tornblom in the United States Patent Office on December 3, 1947 and entitled "Explosionproof Light Fixture of the Vented Type". Of those claims, numbers 14, 15 and 25 were withdrawn by plaintiff leaving claims 16 and 18-23 in issue.

The complaint alleges the existence and ownership of the Tornblom application and refusal of defendant to issue a patent thereon by a decision (App. 52) of the Board of Appeals of the Patent Office, rendered on May 28, 1954 within six months of commencement of the action below. No appeal to the United States Court of Customs and Patent Appeals was taken from that decision.

The answer (App. 6) of defendant admits the allegations of the complaint except it denies that plaintiff is entitled to the judgment sought in view of certain prior patents cited in the proceedings in the Patent Office.

This appeal is from a final judgment (App. 183) of the District Court dismissing the complaint with prejudice. Jurisdiction of the appeal arises from Title 28, United States Code, Section 1291.

STATEMENT OF THE CASE

The Field of Explosionproof Fixtures

The subject matter of the application in question is, in the field of industry or art, commonly designated the "explosionproof lighting fixture" field. It has an important place in the industrial community.

For many years men have been required, by the advances of industry and science, to work in areas flooded with explosive mixtures of gases, vapors, and dusts. To those persons dealing in safety measures, such areas are aptly called "hazardous areas" (App. 66). The locations, so designated, are many and varied, examples being oil and gasoline refineries, hospital operating rooms, paint and varnish shops, flour mills, coal mines, and others. Perhaps the oldest hazardous locations are the coal mines where the Davy lamp was made famous. Receiving more notoriety in recent years are the hazardous locations in hospital operating rooms with their potentially explosive anesthetic vapors (App. 67).

Artificial illumination in most hazardous areas is a necessity. Electric lighting with its advantages is the most popular and has been for many years. It is not, however, free from attendant dangers.

Explosive gases and dusts are dangerous only when some source of ignition is present. One such source is an electric spark, whether it be the spark in a switch, from a broken light cord, or the breaking of an electric lamp. Regardless of the source, the explosion set off by a minute electric spark can, and often is, a death dealing disaster.

The device of the present application is thus not concerned with the trivial, or with a hit or miss operation. It deals with human safety. It must be right or it is, itself, a potential bomb.

Prior Explosionproof Electric Fixtures

Strangely, it is impossible, as a practical matter, to seal an electric fixture to keep out the explosive gas. The permeability of metals, the joint for a switch arm extending through a casing or adjustable parts, all form avenues for slow seepage of gas into a fixture (App. 68).

Quite briefly, the forerunners of the applicant worked along two lines to prevent the ignition of explosive atmospheres by electric fixtures. Along one line of endeavor are the true explosionproof fixtures, and along the other line are the explosion-containing fixtures.

The "true" explosionproof fixtures contained an inert, non-combustible gas, like nitrogen, under pressure to prevent inward permeation of explosive gas. These fixtures hence are commonly called "pressurized" fixtures. They are costly, requiring careful sealing of the joints and cracks and gas systems which demand more or less continuous maintenance, and involve alarm or safety systems in the event of failure of the pressurized gas system (App. 69, 70).

The explosion-containing type fixtures are contained in thick, strong casings, so strong that an explosion inside will not rupture the casing and ignite the gas in the room. This type of fixture is characterized as a "heavy wall" fixture, and as would be expected, is made of special, expensive, high strength metal and glass. Aside from the cost of materials, manufacturing expense is high because joints must be carefully ground to eliminate the flash of flame out of the casing (App. 69-71).

These are the explosionproof electric fixtures devised by the electrical industry up to the time of Tornblom's entry into the field.

The Contribution of Tornblom

Nils Tornblom was discontented with the expense and awkwardness of the "pressurized" and "heavy wall" types of fixtures. He discovered electric fixtures need not have either the pressurized inert gas to prevent explosions or the massive jackets to hold in the explosion.

His contribution has become known as the "vented" type of explosionproof fixture (App. 89). By "vented" is implied the free passage of air and gas into and out of the electric fixture. That is exactly what happens, and without exploding gas outside of the fixture.

How Tornblom reduced the "vented" idea to physical form is disclosed in his application for a patent. As there shown and described, he constructed a lighting fixture having a casing for enclosing the electrical apparatus, whether it be a switch or a lamp. He made that casing with a solid impervious wall portion and another wall portion of a rigid, pervious, porous metal. That porous metal is identified and described in the application for patent as follows:

> "For the purpose of dissipating any gas pressure which might occur in any of the internal chambers of the fixture without permitting the leakage of flame from the latter, an interesting means is provided. In the illustrative fixture, such means comprises a rigid porous metallic disk or plate 79 unitary with each of the handhole plugs 38, 58, and 70. Each of the disks 79 is of appropriate thickness to withstand the sharp rise in pressure within the fixture incident to an explosion due, for example, to arcing in one or more of its various electrical components. Such pressure can be quickly equalized with that of the surrounding atmosphere via a plurality of tortuous, flame arresting paths defined within the porous structure of the disk metal itself. . . ." (App. 12, 13)

Such porous metal contains multitudes of minute passages or holes therethrough. It is made of very tiny particles of metal bonded together at points of mutual contact, so that such passages are "tortuous" (App. 13) or in "zig-zag" form (App. 98). By analogy, its structure can be visualized in enlarged form as somewhat like a bucket of golf balls each of which is stuck to the others at points of contact (App. 87). This leaves a great number of small zig-zag or tortuous paths through the material which permit gas to pass right through. One can easily blow his breath through it. By the time the hot gas and flames of the inside explosion slip through the zig-zags, the heat of the gas is withdrawn by the high conduction of the metal walls about the passages. It cannot trigger off an external explosion.

Tornblom Accomplished More Than Merely Another Type of Explosionproof Fixture

There is no question on this record but that Tornblom contributed to the electrical field a distinct type of lighting fixture it did not have before.

That it is a safe fixture is also beyond dispute. It has been approved by the Underwriters Laboratories for hazardous locations after thorough testing (App. 155).

But did it really mean anything or was it merely another fixture?

The record shows without contradiction it drastically reduces the pressures the casing of an explosionproof fixture must withstand. In fixtures of the same wattage rating and intended for the same applications, the measured explosion pressures are reduced from 96 pounds per square inch in the heavy wall type to 1½ pounds per square inch (App. 124). Hidden flaws in material and defects in workmanship are of little consequence at 1½ pounds per square inch, but possibly serious deficiencies at 96 pounds per square inch.

So, too, the cost of materials both in amount and kind is substantially reduced in the Tornblom fixture. The walls, both metal and glass, are thinner as compared with the "heavy wall" type fixture. As to the "before" (Plaintiff's Exhibit 21) and the "after" (Plaintiff's Exhibit 18), the required thickness of the glass portion of the casing or housing is ¾ inch as contrasted with 9/32 of an inch—a reduction of approximately 75 per cent (App. 126). The impervious metal wall thickness was 3/16 inch as contracted with 5/32 inch—but the vented type fixture used low alloy, low strength, and relatively inexpensive metal as contrasted with a special alloy, high strength, expensive metal required in the predecessor "heavy wall" fixture (App. 126).

As to the weight of the comparable 500 watt size "heavy wall" fixture and its successor 500 watt fixture "vented" in accordance with the invention, the former weighed 30 pounds and the latter weighs 19 pounds—a reduction of approximately 33 per cent (App. 126).

The difference in costs of materials and manufacturing of the "heavy wall" fixture and the successor "vented" fixture embodying the invention will be apparent from the foregoing. The trial court refused to permit testimony on this and other points (App. 124) but it is obvious that a substantial saving is made possible by the present invention. And other ancillary advantages will also be apparent. The "vented" fixtures cost less to ship, they are easier to handle and install, and they fit into closer quarters.

Tornblom's fixture, as compared to the prior "pressurized" fixtures, eliminates the hermitically sealed casing, the pump or pressure source to supply inert gas, and the pressure-sensitive alarm or safety systems to start and stop the pump or to disconnect the electrical supply to the fixture if the pressure drops to a dangerously low value.

The sum of these advantages over what went before the present invention fairly constitutes a "significant advance in the art". The Trial Court refused to make any findings of fact on these matters (App. 140).

The Application Claims in Issue

No claims were allowed by the Patent Office. The claims in issue here are claims 16, 18, 19, 20, 21, 22 and 23 (App. 2-5). Because the court below in its Findings of Fact treated these claims as falling into three groups (Finding of Fact Nos. 8, 9, and 10; App. 182-3) a representative one of each group is reproduced here for convenience:

> "16. In an electric lighting fixture, an explosion-proof fixture casing enclosed partially by a solid impervious wall having a detachable portion and partially by a rigid pervious wall of porous metal integral with said detachable portion of said impervious wall."
>
> "18. In an electric lighting fixture, the combination of an explosionproof fixture casing having a solid impervious wall with an access aperture therein, and a handhole plug having a seating surface of solid wall material integrally bonded to a rigid sintered metallic panel of substantial thickness."
>
> "20. In an explosionproof lighting fixture having an internally partitioned casing including a pair of chambers sealed each from the other against the passage of gas therebetween, said chambers having electrical components therein and access openings to

> the exterior of said fixture, the combination comprising closure members for said access openings, and rigid porous metallic panels unitary with said closure members, said panels being adapted to dissipate gas pressure resulting from internal explosions within said chambers while arresting the passage of flame therefrom."

The Patent References

Six earlier patents have been relied upon by the Patent Office and the Court below.

WILLIAMS

The first is Williams U. S. patent No. 321,166 issued June 30, 1885 (App. 20). It

> ". . . relates to safety-lamps of the Davy description, for use in mines and other places in which there is explosive gas; . . ." (App. 21)

It describes the safety-lamp shown in its drawings by stating:

> "A is the base of the lamp, which also constitutes the oil-reservoir, and up above which the slotted wick-tube *a*, holding the wick *a'*, projects . . .
>
> * * *
>
> "C is the wire-gauze cylinder of the lamp arranged to extend through the ring b^6 down to the bottom of the lamp below the burner and within the glass cylinder B. Said gauze cylinder, which is closed at its upper end by an extension of the wire gauze as usual, projects . . . to . . . any suitable height.
>
> * * *
>
> "Arranged above the top of the gauze cylinder C, at some distance from it, within a socket on top of the cap-piece c^3, is a wire-gauze diaphragm, G, . . . held down to its place by a screw-gland, c^5, made to engage with the socket. This wire gauze diaphragm G . . . gives additional safety to the lamp, as, in case of the top of the gauze-cylinder *c* getting burned or injured at any time . . . the gauze G would prevent the gas from passing through, thus avoiding an explosion."

The mode of operation of the Williams and Davy type lamps is described in Plaintiff's Exhibit 9 (App. 163). Safe operation requires a *continuously burning flame* within the lamp (App. 94).

KEIL

The second reference is Keil U. S. patent No. 489,150, issued January 3, 1893 (App. 23). Its disclosure

> ". . . relates to lanterns for use in mines and like places, with incandescent electric lights . . . [which] may be employed in any part of the mine . . . , and in case of the breaking or cracking of the bulb all fear of the igniting of any dangerous gases within the mines, will be precluded."

With reference to its drawings, the Keil patent states:

> "The bulb holder *a* can be of any suitable construction and the bulb *b* depending from the holder within the lantern may be of any suitable form. * * * Where the inclosing body *g* is formed of wire gauze, it extends through between said rings and is . . . clamped . . . This wire gauze body *g* is also closed at its lower end by the wire disk *g'* . . .
>
> * * *
>
> "In case the lantern body should be crushed . . . the bulb would be cracked or broken, and cause the ignition of any gases which might be within the lantern body by the spark of the incandescent light all liability of ignition of surrounding gases so as to cause explosion, would be prevented by the gauze body . . ."

GOVER

The third patent reference is British Gover patent No. 23,369, accepted December 11, 1897 (App. 26). It deals with an "electric safety fuse" which it states is frequently provided with casings "made with an opening for escape of gases when the fuse gives way". It recognizes the problem that:

> "Should the fuse happen to be near combustible materials or gases there is danger of these being

> ignited by the burning of the fuse or the temporary arc produced at the moment of its fusion."

It illustrates "the fuse wire or strip F" disposed in a

> ". . . casing C [which] has a large opening at the top covered with wire gauze W such as is employed in a miners safety lamp, or other pervious material such as will give a free outlet for gases under pressure but will prevent communication of flame to the exterior."

The operation of the Keil and Gover devices as described in their patents was conclusively shown on this record to be incorrect and dangerously misleading. The proofs are both oral testimony and tests by Underwriters Laboratories (App. 169).

TORNBLOM

The fourth patent reference is Tornblom patent No. 2,392,202 (App. 28) issued January 1, 1946. It discloses and claims an earlier invention of the applicant of the application in issue—an explosionproof lighting fixture of the "heavy wall" type (App. 91), as earlier referred to (This Brief pp. 3-4). That device was "explosionproof" only because it contained and withstood high pressure.

BAKER

The fifth reference patent is U. S. Baker patent No. 2,447,043, (App. 33) issued August 17, 1948. It

> ". . . relates to porous type backfire arresters for use in combustible gas systems such as blowpipes . . ."

The device is shown and described as

> ". . . comprising a casing 10 having a gas inlet passage 11 and a gas outlet passage 12. * * * During operation of a blowpipe for example flashbacks and backfires of the gas strike at a downstream face of a porous [metal] element 15 . . . [which] is retained in a ring 16 which is clamped between separable parts 17 and 18 of the casing 10. Such parts 17 and 18 are clamped together by bolts 19."

Such an arrester is intended to be inserted in a conduit leading, for example, from an acetylene mixer to a welding torch (App. 100). If the gases downstream of the arrester are ignited and "flash back", the porous metal is supposed to prevent ignition of the gas in the conduit upstream of the arrester. The Baker patent states:

> "The normal direction of flow of the combustible gas through the flash arrester A is from the inlet 11 through pores of the porous element 15 and outwardly through outlet passage 12 and pipe coupling 14. But upon occurrence of a backfire the flame moves in the reverse direction."

That the porous metal element does not vent gases and preclude high pressures is evident from the statement:

> "In order that the porous element be not destroyed over the area of the downstream face adjacent the gas outlet passage 12, it has been proposed to provide in that area a solid or nonporous metal deflector . . . *to absorb the shock of a backfire* . . ." (App. 34; emphasis supplied).

BISSELL ET AL.

The sixth patent reference is U. S. Bissell et al. patent No. 2,476,352 (App. 36), issued July 19, 1949 (filed April 24, 1946). It "relates to an explosion resisting lighting fixture of the type employing a fluorescent tube as a light source". The fixture is of the "heavy wall" type (App. 91) in which the casing has threaded access caps 35, 41, 24. For purposes of the present case Bissell et al. may be viewed as showing the same thing as Tornblom patent No. 2,392,202.

Prior Proceedings

A. In the Patent Office

The claims in issue were finally rejected by the Primary Examiner. Appeal was taken to the Board of Appeals. The Board refused claim 16 as unpatentable over Keil, Gover and Williams and Baker references, giving as its reasons:

> "However, giving full weight to the result of the tests, we are of the opinion that claim 16 does not recite the porous metal portion with sufficient particularity to distinguish over the wire gauze used by the Keil, Williams and Gover references. We consider that the term 'porous metal' used in claim 16 does not exclude wire gauze. Neither do we consider that the term 'rigid' avoids such material which has at least some rigidity. In view of this construction we agree with the Examiner that the lamp fixture of Keil fulfills the requirements of this claim. We also agree with the Examiner that the use of a detachable closure member comprising a portion of metal gauze, as used by Gover and Williams, or the sintered metal disk of Baker in an electric lighting fixture would not amount to invention since the pervious element in each of these references is used for basically the same purpose of prevention of the propagation of combustion." (App. 58)

The Board refused claims 18 and 19, which are more specific than claim 16 in requiring a "sintered metallic panel", as unpatentable over the Gover and Baker references, stating:

> "The flame-arresting element of Baker is a sintered metallic panel, such as required by claims 18 and 19, and while Baker does not disclose its use in an electric lighting fixture, we are of the opinion that patentable significance should not be attached to the broad reference to electric lighting fixtures in the claims under consideration.

* * *

> "In considering the Gover reference we note that the fuse housing there disclosed can be termed an electric fixture and we further note the reference to the possibility of using pervious material other than wire

> gauze specifically mentioned. In view of this disclosure we consider that the use of a sintered metal element in the Gover housing would amount to merely a selection of the well known material exemplified by the Baker disclosure discussed above." (App. 59)

The Board of Appeals refused claims 20-23 as unpatentable over the Tornblom and Bissell et al. references in view of either the Williams or the Baker references, stating:

> "While there may be no explicit suggestion for the modification of the detachable covers of Tornblom and Bissell et al., we are of the opinion that one skilled in the art, with the disclosures of the applied references before him, would find the proposed modification [location of the porous metal element shown by Baker in such covers] obvious." (App. 60)

B. In the District Court

At the trial below, plaintiff introduced the testimony of Stephen T. Skrydlak, an independent expert witness, having engineering training and for ten years test engineer in the explosion field with Underwriters Laboratories, Inc.; Carl H. Lindell, Chief Engineer for explosionproof fittings and lighting fixtures for plaintiff company; Frank W. Wehrheim, Vice President in Charge of Sales of plaintiff company; and Wilgot J. Jacobsson, formerly a development engineer with Union Carbide & Carbon Corporation. In addition, evidence of tests on electric lighting fixtures by Underwriters Laboratories, Inc., was introduced.

Following trial, the Court below gave its opinion (App. 133) orally, stating:

> "In any event, the Court concludes that there is a rational basis for the ruling of the Patent Office." (App. 135)

As to claim 16, the Court held:

> "8. In view of the Keil patent disclosure, the provision of an electric lamp fixture with a casing composed of both impervious parts and a rigid pervious wall of

> porous metal would have been obvious at the time the casing invention was made to a person having ordinary skill in the electric lamp fixture art. Claim 16, therefore, does not define invention." (App. 182)

As to claims 18 and 19, the Court held:

> "9. In view of the Baker patent disclosure, the use of a porous sintered metal panel in a closure in the wall of an electric lamp fixture would have been obvious at the time such panel invention was made to a person having ordinary skill in the electric lamp fixture art, particularly in view of the disclosures in the patent to Gover, Williams or Keil. Claims 18 and 19, therefore, do not define invention." (App. 183)

As to claims 20-23, inclusive, the Court held:

> "10. To provide the electric lamp casings of the Tornblom or Bissell et al. patents with closures embodying a rigid porous metallic panel would have been obvious at the time the casing invention was made to a person having ordinary skill in the electric lamp fixture art in view of the disclosures of the patents to Baker, Williams or Keil. Claims 20 through 23 do not, therefore, define invention." (App. 183)

This was followed by the holding:

> "11. Claims 16 and 18 through 23 are unpatentable in view of the prior art." (App. 183)

Having made such ultimate "findings", the Court below entered the Conclusion of Law that:

> "1. The plaintiff is not entitled to a patent containing any of claims 14, 15, 16, 18 through 23 and 25 of application Serial No. 789,444." (App. 183)

It also entered Judgment dismissing the Complaint. (App. 184)

STATUTES INVOLVED

The pertinent sections of the Patent Statutes (Title 35 U. S. Code) read as follows:

> Section 101. Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.
>
> Section 102(a). A person shall be entitled to a patent unless the invention was known or used by others in this country, or patented or described in a printed publicaton in this or a foreign country, before the invention thereof by the applicant for patent in the United States, or
>
> Section 102(b). The invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States.
>
> Section 103. A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.
>
> (Act of July 19, 1952, c. 950, Section 1; 66 Stat. 797, 798).

STATEMENT OF POINTS

1. The Court below erred in holding the explosionproof electric fixtures of the Tornblom application were obvious to one skilled in the electric lamp fixture art.

2. The Court below erred in holding claim 16 in issue does not define invention over the Keil patent.

3. The Court below erred in holding that claims 18 and 19 in issue do not define invention over the Baker patent in view of the Gover, Williams or Keil patents.

4. The Court below erred in holding that claims 20 through 23 in issue do not define invention over the Tornblom or Bissell et al. patents in view of Baker, Williams or Keil.

5. The Court below erred in failing to find that the disclosures of the Williams, Keil and Gover patents are inoperative as explosionproof electric lighting fixtures, and hence improper prior art references.

6. The Court below erred in failing to find that the device disclosed in the Baker patent does not reduce pressure within a casing for a welding flame arrester, and did not in fact suggest to anyone its use for explosionproof electric lighting fixtures.

7. The Court below erred in failing to find that the device of the application claims in issue constitutes a substantial advance in the electric fixture art and has been recognized commercially as such.

8. The Court below erred in failing to find that the language and terms of claim 16 in issue have a definite and consistent meaning in the application and in the art, and as so defined distinguish from wire gauze.

9. The Court below erred in concluding that the plaintiff is not entitled to a patent containing any of claims 16 and 18 through 23 of application Serial No. 789,444.

10. The Court below erred in concluding that the complaint should be dismissed, and in entering judgment to that effect.

SUMMARY OF ARGUMENT

I. At the trial below, the Court refused to permit or listen to evidence showing the plaintiff's independent expert witness to be eminently qualified in the specialized field of explosionproof lighting fixtures, and his testimony to be entitled to great weight. The Court below refused to permit two experts to testify on the same point, yet later refused to make any findings of fact on essential fact questions about which the expert witness testified. Rather, the Findings of Fact below are limited to legal interpretations of six prior patent documents.

The trial procedure below and the purported findings of fact are such as to make this case fully reviewable.

II. The prior art references lead not to Tornblom's device, but away from it. Expert testimony corroborated by evidence of careful tests conducted by an authoritative independent laboratory and by a technical text proves conclusively that three basic references (Williams, Gover, and Keil patents) are fatally inoperative as explosionproof electrical light fixtures. Being inoperative at their very roots, they are not valid references against the claimed invention, which does accomplish the desired result in an advantageous manner. If a man skilled in the art had followed the teachings of these references, he would have been headed in the wrong direction. Absent essential findings, this Court should find for itself on this basic fact question.

Of the other references, the Tornblom and Bissell et al. patents represent "heavy wall" type fixtures and are burdened with the very drawbacks which Tornblom successfully overcame by the invention in issue. The Baker patent deals with welding equipment and discloses a porous metal element inserted in a welding line to arrest backfiires. It does not vent or reduce internal pressures, the essential function which yields the marked advances afforded by Tornblom's new explosionproof lighting fixture. Baker does not provide a key to Tornblom's fixture.

III. It is conclusively established by the record that Tornblom's combination meets the standard of patentable invention. It constitutes a material advance in the art not made possible by the fifty year old, inoperative disclosures of Williams, Gover and Keil, and relieves the industry of the principal disadvantages of the "heavy wall" and "pressurized" types of explosionproof fixtures to which it had been relegated before Tornblom's invention. By hindsight, it might be made to appear "simple" to do what Tornblom has done, but that is not the test of patentability. The fact remains that the step Tornblom took did not occur to those working in this field or the welding field. The incentive to the art was present, for once accomplished, Tornblom's invention filled a long-standing need, and so advanced the art that it was immediately accepted by the industry.

IV. As a matter of terminology, the words "a rigid pervious wall of porous metal" in claim 16, when taken as they must be in the compelling context of the specification and with the meaning they have to those working in this art, define a rigid metal structure with multitudes of minute tortuous, zig-zag passages therethrough. They cannot, within reason, be construed to embrace "wire gauze" which, like house screening except for its smaller mesh size, has direct openings through it.

ARGUMENT

I.

THE TRIAL PROCEDURE BELOW AND THE PURPORTED FINDINGS OF FACT ARE SUCH AS TO MAKE THIS CASE FULLY REVIEWABLE

The Trial Court Erroneously Based Its Decision on a Lack of the Evidence Which It Expressly Refused Admission

The Court below refused to listen to the qualifications of plaintiff's expert witness, Mr. Skrydlak, and excluded evidence showing him (even more forcefully than the present record does) to be an eminent expert *in the art of explosionproof fixtures* by virtue of his many years' experience in testing such fixtures at the Underwriters Laboratories. Mr. Skrydlak was permitted only to testify that he was a chemical engineer and had been employed a little over ten years at the Underwriters Laboratories, Inc. (App. 64-65). With that, the Court wanted to hear no more, repeatedly interrupting:

> "The Court: I think you have qualified this witness sufficiently." (App. 64)
>
> * * *
>
> "Q. When did you obtain that degree?
>
> "The Court: He said he is a chemical engineer. The Court is satisfied with the qualifications." (App. 65)
>
> * * *
>
> "Q. What is that organization?
>
> "The Court: I am not interested in that. Let us get to the case.
>
> "Mr. Osann: Your Honor, if I might explain, Underwriters Laboratories did some of the laboratory tests which we want to put evidence in on, and I would like to have something in the record on that.
>
> "The Court: Well, you have made the statement. That is enough." (App. 65)
>
> * * *
>
> "Q. And you were—
>
> "The Court: Now, I will hear no more about his qualifications. Get to the case, Mr. Osann. Don't let's waste time. I am not interested in the witness' life history. You have qualified the witness." (App. 65)
>
> * * *

> "Q. Were you assigned to any particular type of testing there [at Underwriters Laboratories]? A. I was. I tested—
>
> "The Court: Now, let us get to the case. Let us have no more preliminaries.
>
> "Mr. Osann: Your Honor, what I am trying to do is qualify this man as an expert in the field of explosion-proof—
>
> "The Court: Well the Court is accepting him as an expert. I never permit counsel, unless there is a dispute, to consume unnecessary time qualifying witnesses. Now will you proceed with your next question that bears on the issues of this case?" (App. 66)

Moreover, in pressing plantiff's counsel to rest the case, and upon being informed that plaintiff had additional witnesses, particularly to testify regarding the Baker reference, the Court below refused to allow more than one witness expert in the art, saying:

> "The Court: No, *I won't hear two experts on the same point.* You have had Mr. Skrydlak on the Baker patent." (App. 118; Emphasis supplied)

The Court below thereafter, having shut its mind to the high degree of experience and authority of the single expert that it would hear, refused to make *any* findings, either in the affirmative or negative, as to basic facts brought out by that expert's testimony. See plaintiff's Motion Under Rule 52(b), F.R.C.P. (App. 184) and Court's blanket denial thereof (App. 197). That this unduly prejudiced the Court's decision is clear from the proceedings relative to findings of fact:

> "The Court: Well, there was no proof as to whether they [certain ones of the reference patents] were operative or not. I am not going to make any findings on that.
>
> "Mr. Beveridge: I think Mr. Skrydlak, the expert, testified rather specifically as to the operativeness of each reference. For example, the Davy lamp was stated to be unsafe to be lit.
>
> "The Court: Well, I am not going to make any findings on the basis of *one* witness to the effect that the Davy lamp is unsafe, because it has been in use in

> mines ever since 1880. I want *more proof* before I make a finding that it is unsafe.
>
> * * *
>
> "I think it would be improvident on my part to make such a finding on the basis of the statement of one party as a witness." (App. 139, 140; Emphasis supplied)

Mr. Skrydlak was not a party but an independent expert in the field. After rejecting proof of his qualifications as such, and refusing to admit testimony by another offered witness, it was clear error for the Court below to conclude a point was not proved. This is particularly so when there is in this record no competent evidence contrary to the testimony of the witness.

The Trial Court Erroneously Failed to Consider the Factual Record Made

The Court below refused to make findings on the basic issues of fact but instead dealt only with a legal interpretation of certain limited documents. Its Findings of Fact go only to what six patent references "disclose". (See Findings of Fact Nos. 3-7; App. 181-2). Conspicuous by their absence are any findings of fact as to (a) inoperativeness of the devices constructed according to certain references or combinations of them, (b) what the Baker patent in fact taught to the engineers employed by the company which owns it, and (c) the advances which the present invention brought to the art.

Plaintiff asked the Court below to find whether or not the Davy lamp disclosed by the Williams reference would prevent an external explosion if a spark occurs therein after it is placed unlighted in an explosive atmosphere (Motion; Proposed Finding No. 9; App. 187). Plaintiff asked the Court below to find whether or not the lantern disclosed by the Keil reference would be safe for an electric lighting fixture in hazardous locations (Motion; Proposed Finding No. 10; App. 188). Plaintiff asked the Court below to find whether the device disclosed by the

Gover reference is safe in hazardous locations (Motion; Proposed Finding No. 11; App. 188).

The documents themselves are not evidence of the truth of any fact asserted by them. The competent evidence of record conclusively demands a finding of "No" on each of these fact questions, establishing the prior devices to be inoperative as explosionproof *electric* fixtures (This Brief p. 23-27). Yet the Trial Court refused to find *either way;* it simply denied (App. 197) plaintiff's Motion Under Rule 52(b), F.R.C.P.

Plaintiff asked the Court below to find whether or not those acquainted with the Baker patent, and faced with the problem of preventing explosions due to sparks or flame in hazardous locations, derived from that patent any use of its disclosure other than a flame arrester in a blowpipe (Motion; Proposed Finding No. 15; App. 189). Uncontradicted testimony required a negative answer (This Brief, p. 36, 37). The Trial Court, however, would not find *either* in the negative or the affirmative; it summarily denied the motion.

Plaintiff asked the Court below to find whether or not electric lighting fixtures of Tornblom provided itemized advances in the art (Motion; Proposed Finding No. 6; App. 186-7). The Trial Court refused to find either in the affirmative or the negative.

Determination of these basic fact questions is necessary to an ultimate conclusion on the final question of the presence or absence of patentable invention. Operativeness or inoperativeness of prior art references has always been a point of consideration; so too have been the knowledge or suggestions derived by those skilled in the art from a prior art reference, and the actual advances made possible from the contribution of an applicant for patent.

The only clue in the record for the erroneous failure of the Court below to find on crucial fact issues is its statement that:

> "... I am not going to weaken my ruling by diluting it with your proposed findings." (App. 140)

II.

THE PRIOR ART REFERENCES LEAD NOT TO TORNBLOM'S DEVICE BUT AWAY FROM IT

The so-called "basic" reference patents on which the judgment below is premised taught this art only dangerous and misleading theories of operation. They point to invention by Tornblom rather than detract from it.

The Davy Lamp Patents

The lamp described in the Williams patent is, as it states, representative of the Davy type lamp. It is an open flame, *continuously burning* device. Its operation is described by Ganot's Physics text (Eighteenth Edition, 1910, published by William Wood and Company, New York; pp. 453, 454, App. 164-5), and by the testimony of Mr. Skrydlak:

> "Q. If you carry a lighted Davy safety lamp into an area where there are explosive mixtures of gas, why is it that the Davy safety lamp will not cause an explosion? A. Because, as I mentioned before, if it is brought in while it is lit, the gases will pass through the screen and will be consumed by the flame at the wick, and the wire screen at that time is sufficiently broad and having enough metal and mesh of sufficient size to cool the flame and prevent the ignition of the explosion mixture in that area." (App. 94)

The limitations of the Davy lamp are clear on this record. It is useless for an intermittent spark or flame. Its essence is the continuous burning of explosive gas as soon as it enters the lamp. If the explosive gas accumulates in the lamp and a spark then occurs, the flame blows through the wire gauze. Even a "sudden draught" of air will blow the flame of the wick through the gauze (Ganot's Physics, App. 164-5). Mr. Skrydlak so testified:

> "Q. Mr. Skrydlak, if the lamp shown in Williams patent 321,166 were filled with an explosive mixture and were put into a room or chamber also filled with an explosive mixture and a spark were to occur in the inside of the lamp, inside the wire gauze, what in your opinion would occur? A. That explosion would occur

> inside the screened area with such force, in my opinion, that it would be forced out of the screened area and ignite the surrounding mixture because of the sudden shock and force of the explosion." (App. 96)

There followed from the Davy lamp, a misconception that if it worked for a lighted wick, certainly it would work for an electric fixture. On that misconception the devices of the Keil and Gover patents are founded. As a practical matter the devices of the Keil and Gover patents reduce to the following.

The lamp described by Keil is:

> " . . . an electrified version of the Davy lamp or the Williams patent. Instead of using a wick, which is kept ignited by a fuel, a liquid fuel, they use an electrical lamp bulb, . . . encased in a gauze or wire cylinder . . . " (Skrydlak testimony, App. 97)

The device disclosed by Gover is:

> ". . . a fuse simply consisting of a base and a body . . . having . . . two layers of wire gauze or screen . . . bonded to the top of the open end of the cylinder, and the fuse assembly is secured . . . inside the shell to encase it therein." (Skrydlak testimony, App. 99)

Plaintiff's expert witness gave a simple statement of the use of the lamp shown in the Keil patent:

> "Q. Mr. Skrydlak, if the lamp shown in Keil patent No. 489,150 were placed inside of a chamber filled with an explosive mixture of gases, and those gases permitted to penetrate inside the wire screen element of the Keil device, what in your opinion would happen if that bulb were to break? A. If that bulb were to break, the heat of the filament would be sufficient to ignite the explosive mixture within the wire screened area and would result in an explosion of sufficient force and velocity to force the flame resulting from the explosion outside of the screen and ignite the explosive mixtures surrounding the lamp." (App. 97)
>
> * * *
>
> "Q. Mr. Skrydlak, as an electrical fixture for use in explosive atmospheres, is the device of the Keil

> patent No. 489,150, safe in your opinion? A. No, not safe at all." (App. 99)

And as to Gover:

> "Q. Suppose the device of the Gover patent were filled with an explosive mixture, gases, and the device then put in a chamber also filled with explosive gases, then assume a spark takes place inside the Gover device, what in your opinion would happen? A. Well, in my opinion, the same thing would happen as I mentioned in Williams and Keil, the force of the explosion inside the enclosure would force the flame or resulting spark or hot gases outside of the wire screen area and ignite the mixture because the wire screen would not be sufficient to cool the hot gases below the ignition point of the gases, or would not have a sufficient path between the mesh to restrict the flame within the enclosure.
>
> "Q. Would the Gover reference in your opinion be safe to use in a hazardous location? A. No sir, no, I don't think so." (App. 99, 100)

That testimony is uncontradicted and supported by the indisputable physical fact, as well as by tests by an independent laboratory (App. 167-9).

If these patents teach anything relevant, they mislead the art down a dangerous path—one leading to disaster. If these patents are entitled to any consideration at all, Tornblom was headed in the wrong direction when he made the invention here in issue.

To fly in the face of such disastrous attempts to make a vented electric fixture is a credit to Tornblom's genius.

The Underwriters' Tests Dramatically Prove the Inoperativeness of the Prior Davy Lamp Teachings

To be sure there was no mistake as to the proofs of the prior teachings on explosionproof electric fixtures, plaintiff submitted electric fixtures to Underwriters Laboratories for test.

Those fixtures are in evidence. (Pltf's Exhs. 11, 12). They are constructed as shown in the present Tornblom application drawings, except the first is equipped with the wire gauze or screen of Williams, Keil and Gover in the closure caps. The second has rigid, pervious porous metal, as required by the claims in issue.

They were subjected to rigorous explosion safety tests by Underwriters Laboratories, Inc. (App. 165, 167), who reported:

> "The explosive mixtures surrounding the device having the *screens* in cover *exploded in each test* as indicated below, whereas, in the case of the device with *porous plates* in the covers, no flame or sparks emitted from the device and *no ignition of the surrounding explosive mixtures occurred.*
>
> * * *
>
> "The results of the tests, in which *wire mesh screening* was used in the covers of the illuminators, are not considered acceptable." (App. 168, 169; Emphasis supplied)

The expert witness, Mr. Skrydlak, observed these tests conducted by the Underwriters Laboratories, Inc. (App. 104). He testified:

> "Q. Mr. Skrydlak, on the basis of these tests, in your opinion, would an electric lighting fixture vented by wire gauze of the type suggested in the Williams, Keil and Gover patents be safe as an explosionproof lighting fixture? A. In my opinion it is not safe, which is corroborated by the—
>
> * * *
>
> "The Witness: It would not be safe.
>
> "By Mr. Osann:
>
> "Q. Mr. Skrydlak, if the solid closure cap shown in the Tornblom patent, 2,392,202 or in the Bissell et al. patent were replaced by caps having wire screen or wire gauze of the type shown in the Williams, Keil or Gover references, would the resulting fixture, in your

> opinion, be safe for use in hazardous areas? A. No; it would not be safe." (App. 106-7)

* * *

Counsel for the appellee could not deny the proof of these tests but commented:

> "I might say that it is no longer in issue as to whether a sintered metal flame arrester would be better than one made of wire gauze." (Record, Transcript, p. 15)

That comment expresses the view not only of appellee's counsel but of the Board of Appeals, and apparently the Court below as well. It is entirely beside the point.

In this field of endeavor there is no room to compare *degrees* of effectiveness and to consider that porous metal "does a better job" than wire gauze or screen. The point is that the wire gauze or screen shown by the prior art references is *inoperative and dangerous,* whereas the rigid porous metal of the "vented" fixture here being claimed is safe and does under all conditions prevent explosions outside the fixture. The difference is the same as the difference between life and death, both figuratively and literally.

The Davy Lamp Patents Are Not Valid References to Negative Invention

Under established law, prior art references which are inoperative, and which cannot be made operative by minor variations obvious to those skilled in the art, cannot serve to negative patentability of claims to an invention which is operative to accomplish the intended purpose. This was sounded by the U. S. Supreme Court as early as 1870:

> "Whatever may be the particular circumstances under which the [prior] publication takes place, the account published, to be of any effect to support such a defence [anticipation], must be an account of a complete and *operative* invention capable of being put into practical operation." *Seymour* v. *Osborne,* 78 U.S. 516, 555. (Emphasis supplied)

This Court has recognized that rule of law and firmly applied it in *In re Coykendall,* 58 App. D.C. 280, 281-2; 29 F. 2d 868, 869 (1928), where it said:

> "The appellant was the first to combine them so as to bring a new system of machinery into actual public service, where its usefulness and value are approved by notable commercial success. *The invention of Sitney, on the other hand, was inoperative;* it never entered into actual service, *and cannot be considered as an anticipation of appellant's invention.* 'A patent for an invention which successfully accomplishes a useful result is not void, for anticipation or prior use, because of a prior device, however similar in combination or close in resemblance to that of the patent, where such prior device was not operative, and failed to produce the result sought, and which is produced by the device of the patent.' " (Emphasis supplied)

In the present instance there is uncontradicted evidence by an eminently qualified, independent, and disinterested expert witness corroborated by independent tests and a standard textbook which unalterably proves that the Williams, Keil and Gover devices by their nature simply will not work as explosionproof electrical fixtures (App. 163, 165, 167).

Under these circumstances, the proofs satisfy the test as clearly set forth by this Court in *The Bullard Company et al.* v. *Coe, Com'r Pats.,* 79 App. D.C. 369; 147 F. 2d 568 (1945):

> "In order to show that the appealed claims are inventive it was necessary for appellant to prove that [the prior patent] Svenson (1) was not operative and (2) could not be made operative by slight changes within the skill of a competent mechanic or, in other words, without inventive genius."

On the present record, and in the light of the controlling law, we submit that the effectiveness of the Williams, Keil, and Gover references, singly or combined with the Tornblom or Bissell et al. patents, has been destroyed.

"Findings" Premised on Documents in Complete Disregard of the Undisputed Factual Record Are Fully Reviewable Here

Such Findings of Fact as the Court below did make (Findings of Fact Nos. 3-7, App. 181) were simply interpretations of documents. The ultimate "Findings of Fact" Nos. 8-10 as to whether the claims in issue define invention are bare conclusions of law based on comparisons of the documents and the claims in issue.

Evidence on the basic facts, noted above, necessary to reach ultimate findings or conclusions was partly oral testimony and partly documentary. That evidence had not been before the Patent Office. It is competent, and it is *undisputed.*

In *Dollar* v. *Land,* 87 App. D.C. 214; 184 Fed. 2d 245, 248, 249 (1950), "the findings of the trial judge rested entirely upon documentary evidence or undisputed basic facts". This Court considered the evidence anew and substituted its own findings in reversing the trial judge, following the rule laid down by the Supreme Court in *United States* v. *United States Gypsum Co.,* 333 U.S. 364, 395 (1948). This Court quoted with approval as its interpretation of the rule, the language of the Second Circuit Court of Appeals in *Orvis* v. *Higgins,* 180 F. 2d 537, 539 (1950), where it was said:

> "Where a trial judge sits without a jury, the rule varies with the character of the evidence: (a) If he decides a fact issue on written evidence alone, we are as able as he to determine credibility, and so we may disregard his finding. (b) Where the evidence is partly oral and the balance is written or deals with undisputed facts, then we may ignore the trial judge's finding and substitute our own, (1) if the written evidence or some undisputed fact renders the credibility of the oral testimony extremely doubtful, or (2) if the trial judge's finding must rest exclusively on the written evidence or the undisputed facts, so that his evaluation of credibility has no significance."

This Court is free to consider the evidentiary import of the documents upon which the Trial Court made its Findings of Fact and Conclusions of Law.

The Trial Court had before it evidence which was not before the Patent Office, and which was not contradicted.

> "That being true, the District Court was not controlled by the presumption of correctness which attaches to Patent Office action, but was free to reach its own conclusion on the basis of the fuller information which was before it." *Stradar* v. *Watson, Com'r Pats.*, App. D.C. , ; F. 2d , ; 113 U.S.P.Q. 365, 367 (1957); Appeal No. 13,517, decided May 13, 1957.

The Court below did not, apparently, "reach its own conclusion", but took refuge in its feeling that:

> "In any event the Court concludes that there is a rational basis for the ruling of the Patent Office." (App. 135)

Absent findings as to essential, basic fact questions on undisputed "fuller information" and "its own conclusion" by the Court below, this Court is permitted "a subjective opinion or formulation of a judgment", *L-O-F Glass Fibers Company* v. *Watson, Com'r. Pats.*, 97 App. D.C. 69, 75; 228 F. 2d 40, 45, 46 (1955). Especially is this so where, as in the present case:

> "The Court [below] omitted to make any finding of such facts. Since the facts which the finding fails to reflect were relevant under the pertinent principles of law stated above, the Court should have found them. . . * * * As in our view the Court could properly under the uncontradicted evidence have made no finding except one which reflected the facts which we have stated, it would be idle to return the case for further findings." *Levin* v. *Coe, Com'r. Pats.*, 76 App. D.C. 347, 356; 132 F. 2d 589, 598 (1942).

The evidentiary record and judgment thereon in this case are fully reviewable.

The Baker Patent Does Not Provide a Key to the Tornblom Fixture

The final prior patent cited by the Patent Office and by the Court below is Baker patent 2,447,048. This patent is separately considered here because it relates not to lighting fixtures but to welding apparatus.

The patent states that it relates:

> "... to porous type backfire arresters for use in combustible gas systems such as blowpipes, ..." (App. 34)

The nature of the device shown was described at trial as:

> "A. Well, this is called or what is known as a flashback arrester used in welding apparatus. It is provided between the torch end of the welder and the gas lines from the cylinders which would feed the mixture needed for its burning." (Skrydlak Testimony, App. 100)

As to the nature of a "backfire", the testimony is:

> "Q. Mr. Skrydlak, would a flash-back or backfire produce explosive pressure in the welding line? A. Oh, I would say it would create an extremely high pressure.
>
> "Q. And where would that pressure go? A. It would be forced against the exposed area, along this element, No. 15 and 20 combined.
>
> "Q. Would the torch have anything to do with relieving any of that pressure? A. Yes, it would be about the only way it could be relieved because we have a clamping engagement between No. 17 and 18, such as we have in the heavy wall construction of electrical devices, which would only allow any pressure to dissipate and lower over a long time.
>
> * * *
>
> "Q. Does the metallic element 15 of the Baker patent vent pressure? A. Not in the sense I explained it before. You don't get a soft explosion, as I mention, but you get a very sharp report, a sudden jar, which results in high pressures." (App. 101, 102)

The porous metal element 15 described in the Baker patent is thus a flow element in a gas line between a gas tank and a burning blowpipe. It arrests flame which may on a "backfire" tend to retreat through the gas line to the tank. *It does not serve to vent expanding gases and to relieve the high pressures* which are created in the housing and the supply conduit. Baker does not "treat or mention explosionproof electrical fixtures". (App. 101).

Failing to deal with explosionproof electrical fixtures, and failing to teach that porous metal can be made to serve *both* as a flame arresting means *and* as a pressure venting means, Baker does not provide a clue to the invention here claimed.

Such was the state of art at the time Tornblom made his contribution. Early attempts to electrify the Davy lamp, which when tested are fatally and inherently defective, pointed to the impossibility of a safe, operable electric fixture of a vented type. Only in the welding field did the Patent Office find even a reference to porous metal and there used in a different manner in a gas pipe. The argument of obviousness breaks down before it can even get started.

III.

THAT THE UNIQUE COMBINATION OF TORNBLOM MEETS THE STANDARD OF INVENTION IS CONCLUSIVE ON THE EVIDENTIARY RECORD MADE

The Tornblom Device is a Substantial Advance in the Electric Lighting Field

The advance made in the art is a material fact to be found in determining the presence of patentable invention.

> "In administering the patent law the Court first looks into the art to find what the real merit of the alleged discovery or invention is and whether it has advanced the art substantially." *Eibel Process Co.* v. *Minnesota & Ontario Paper Co.*, 261 U.S. 45, 63 (1923).

The manner in which the Court "looks into the art" in determining the ultimate question of patentability has been precisely stated by the Court of Customs and Patent Appeals:

> "This Court has frequently stated that, in attempting to ascertain the presence or absence of invention, the courts should resort not only to an attempt to determine whether an applicant's novel feature is within the capacity of a skilled mechanic in the art, but also to the history and the underlying state of the art at or about the time of the alleged invention, the occasion for it, the advantages and successes it achieves." *In re McKenna et al.*, 203 F. 2d 717, 720 (CCPA, 1953).

The Court below in ruling on the invention in issue here disregarded entirely the Supreme Court's instructions that it determine "whether it has advanced the art substantially".

There is no question, in spite of the earlier attempts at a vented electric fixture, that Tornblom's device is safe. It was tested by Underwriters Laboratories, Inc. in 1947 and approved (App. 155). It was again so tested and found safe in 1957 (App. 169).

The invention here brought distinct and significant advances which had not and could not be realized from the "heavy wall" and "pressurized" fixtures in use up to that time.

Mr. Lindell, a chief engineer for Appleton Electric Company, testified relative to two 500 watt incandescent explosionproof fixtures, the first (Pltf's Drawing Exh. 21) being a "heavy wall" type, and the second (Pltf's Drawing Exh. 18) being a "vented" type embodying the invention and superseding the first. As to the "heavy wall" fixture, the measured internal explosion pressure was "96 pounds to the square inch" (App. 124), while that of the vented fixture was only "one and a half pounds to the square inch" (App. 124). Of the practical significance of this greatly reduced internal explosion pressure, Mr. Lindell testified:

> "We are required [in 'heavy wall' types] to have heavier thicknesses of wall on the glass globe, and we had to use a high strength, a high alloyed strength type of aluminum material; whereas in the vented type we could use a wall thickness of glass much thinner, and a less costly low strength aluminum material." (App. 125)
>
> * * *
>
> "On the 500 watt non-vented type of fixture our [glass] wall thickness was three-quarters of an inch, and on the vented type of fixture . . . the [glass] wall thickness was only nine thirty-seconds of an inch." (App. 126)
>
> * * *
>
> "In the non-vented type of fixture . . . we used a high alloyed material and [metal] wall thicknesses were approximately three-sixteenths of an inch; on the vented fixture, low alloy, tensile strength material [metal] with the wall thickness of approximately five thirty-seconds of an inch." (App. 126)
>
> * * *
>
> "The heavy wall fixture [Pltf.'s Exh. 21] weighed approximately 30 pounds." (App. 126)

The vented fixture, Plaintiff's Exhibit 18 "weighed 19 pounds" (App. 126).

These facts were not considered and were not mentioned by the Trial Court in its Opinion (App. 133) and Findings of Fact (App. 181). The Trial Court refused to face up to them in dodging from ruling either in the affirmative or negative on Plaintiff's Proposed Finding of Fact No. 6 (Motion, Rule 52(b), App. 186). But this Court can determine these undisputed facts, and together they conclusively establish that Tornblom's invention "has advanced the art substantially".

The commercial success and acceptance by the industry which the invention has enjoyed further point to the advance that has been made. The dollar value of sales of electric fixtures made by Appleton Electric Company over the last 5½ years was $1,476,383.48 (App. 178)—and the market for these special explosionproof fixtures, as compared to conventional fixtures, is "A considerably lesser market . . ." (App. 132). The Trial Court conceded impressive commercial acceptance and success:

> "The evidence shows that there has been considerable practical exploitation and use of this invention by plaintiff and that the plaintiff has sold large quantities of fixtures of the type on which a patent is sought." (Opinion, App. 133)

The Court below refused, however, to make a finding of fact on that issue.

The fixture of Tornblom not only makes substantial contributions, but those contributions are of such significance as to have called for its appearance years before Tornblom if it had been an obvious expedient. *Paramount Publix Corp.* v. *American Tri-Ergon Corp.*, 294 U.S. 464, 474 (1935).

The Electrical Industry Had Long Been Relegated to Less Desirable Fixtures

The uncontested history of the art prior to the present invention shows that industry was using either "heavy wall" type or "pressurized" type explosionproof electric light fixtures. There was need for improvement; both had serious disadvantages (This Brief, p. 3, 4). Despite the Davy Lamp and the fifty year old teachings of Williams, Keil, and Gover, industry was relegated to thick, strong, expensive and bulky casings, or sealed casings with pumps to supply inert gas under pressure.

A "long felt want", not satisfied by the art and resulting in immediate acceptance of a new device has time after time been tagged as a criterion of invention. *Loom Company* v. *Higgins,* 105 U.S. 580 (1881); *Expanded Metal Company* v. *Bradford,* 214 U.S. 366 (1909); *Goodyear Tire & Rubber Co.* v. *Ray-O-Vac Co.,* 321 U.S. 275 (1944); *L-O-F Glass Fibers Co.* v. *Watson, Com'r. Pats.,* 97 App. D.C. 69; 228 F. 2d 40, 46, 47 (1955).

That criterion is forcefully persuasive here of the presence of more than the obvious skill of a worker in the art.

The Factual Account of the Baker Patent Negatives Obviousness of Tornblom's Device

The Baker patent relates to a porous metal blow element inserted between the tank and the torch in gas welding equipment. The porous metal arrests flashbacks, but does not vent or reduce pressures.

Is it "obvious to those skilled in the art" to derive from Baker's disclosure and the others, the combination of elements from which Tornblom realized, for the first time, a new and advantageous type of explosionproof electric light fixture?

The Baker patent is, as shown on its face, owned by Union Carbide and Carbon Corporation. That company is eminent in industry as a manufacturer of welding equipment and acetylene gas. Plaintiff's witness, Wilgot J. Jacobsson, was employed by Union Carbide for twenty-nine years (retiring in 1954) as a development engineer on welding and cutting torches, blowpipes, flame arresters and related equipment (App. 128). Mr. Jacobsson testified that Union Carbide has acetylene generating plants in which there is a hazard of explosion from sparks or flames, and that he is familiar with the safety precautions taken by Union Carbide engineers to guard against such explosions.

He further testified that, to his knowledge, the teachings of the Baker patent never suggested to the Union Carbide engineers that they might be adapted into an explosion-proof lighting fixture for use in Union Carbide acetylene plants (App. 129).

The safety engineers of Union Carbide, who undoubtedly were familiar with the Baker disclosure, and who were faced with the problem of preventing acetylene explosions in their own plants, did not derive from Baker any suggestion as to how to make an improved explosionproof electric lighting fixture.

If they did not find it "obvious" from the Baker patent, certainly Baker did not make Tornblom's invention "obvious to one skilled in the art".

Determination of the presence or absence of patentable invention often requires conjecture and surmise as to what a prior patent *might have* taught the art. Seldom, as is present here, is there a record showing what *in fact* the prior patent did teach to those skilled in the art. On this record, denial of patentable invention can be founded only on an assumption that the engineers of the gas welding art and the electrical art were stupid. Such an assumption defies common reason.

The Standard of Invention is Met Both Objectively and Subjectively

The controlling standard of patentable invention is Title 35, U.S. Code, § 103. Patentability is negatived only

> " . . . if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious . . . to a person having ordinary skill in the art to which said subject matter pertains."

That is the ultimate test. But many factors need, under the established law, to be considered in arriving at the ultimate conclusion as to obviousness to the person skilled in the art.

> "But the law has other tests of the invention than subtle conjectures of what might have been seen and yet was not. It regards a change as evidence of novelty, the acceptance and utility of change as a further evidence, even as demonstration." *Diamond Rubber Co.* v. *Consolidated Tire Co.,* 220 U.S. 428, 435 (1911)

That invention may, and often does, lie in combining structural elements—and even though each is individually old—is so familiar as hardly to require citation of authority. *Seymour* v. *Osborne,* 78 U.S. 516, 548 (1870); *Loom Co.* v. *Higgins,* 105 U.S. 580, 591 (1881); *Levin* v. *Coe, Com'r. Pats.,* 76 App. D.C. 347; 132 F. 2d 589, 596 (1942).

Nor is *post facto* wisdom gained from Tornblom's own disclosure, a test here. That the invention now seems simple has often been the "case with inventions of the greatest merit." *Loom Co.* v. *Higgins,* 105 U.S. 580, 591 (1881).

This has been forcefully sounded by this Court:

> "All the patents relied upon by the Patent Office as anticipating Lucke's device were before these engineers, yet, highly skilled in the art as they were, they were unable to do what Lucke has done; namely, produce a machine that is a greater advance over the prior art than any one of the patents referred to by the Patent Office tribunals. It is comparatively easy, now that the Lucke device is in evidence, to take this and that from the references and achieve a *nunc pro tunc* solution of the problems confronting Lucke when he made his invention." *Lucke* v. *Coe, Com'r. Pats.,* 63 App. D.C. 61, 65; 69 F. 2d 379, 383 (1934).

The probing question is *why,* with the industry relegated to the disadvantages of the "heavy wall" and "pressurized" fixtures, with the Davy lamp patents standing for some fifty years, with the Baker patent available to the industry and owned by a company faced with the need for explosionproof electric fixtures in its own plants—*why* was Tornblom's device not produced and utilized before?

The answer can only be that none of those working in this art conceived it. It was not obvious to them.

On a record such as this, the standard of patentable invention has been met. The "whole [of Tornblom] in some way exceeds the sum of its parts", *Great A. & P. Tea Co.* v. *Supermarket Corp.,* 340 U.S. 147, 152 (1950); exceeding all expectations and yielding "surprising consequences which even the experts failed to find obvious". Tornblom gave the art a fixture which, like the Davy lamp but unlike the "heavy wall" or pressurized types, could breathe; and yet, unlike the Davy lamp was completely *safe,* and unlike the "heavy wall" type could be made with light, thin, inexpensive walls.

This Court has said in a comparable case:

> "We would not 'lightly' reverse the able trial judge, but we, too, have read the transcript and examined the exhibits. While there is evidence upon which, in part, the findings can be supported, on the entire evidence we are left with the definite and firm conviction that a mistake has been committed. On the record made and with the exhibits before us, we are permitted a 'subjective opinion or formulation of a judgment', which when so predicated, makes clear that the 'combination and improvement admittedly brought about are the product of creative talent' which lifts the Cook claim 1 to the level of patentability over and above the prior art cited." *L-O-F Glass Fibers Co.* v. *Watson,* 97 App. D.C. 69, 74-5; 228 F. 2d 40, 45, 46 (1955)

On this record, this Court may and should conclude that the combination and improvement brought about "are the product of creative talent which lift" Tornblom's claims to the level of patentability.

IV.

THE LANGUAGE OF CLAIM 16 DEFINES A NEW FIXTURE

Aside from the question of whether Tornblom's device constitutes a patentable advance in the art, the Patent Office has contended that as a matter of terminology the language of claim 16 "reads on" the Keil disclosure, stating

> " . . . we are of the opinion that claim 16 does not recite the porous metal portion with sufficient particularity to distinguish over the wire gauze used by the Keil, Williams and Gover references. We consider that the term 'porous metal' used in claim 16 does not exclude wire gauze. Neither do we consider that the term 'rigid' avoids such material which has at least some rigidity." (App. 58).

The Trial Court did not consider this point; it is not mentioned in the Opinion (App. 133) or the Findings of Fact (App. 181).

The Characterization of Claim 16 Terms in the Specification Cannot be Ignored

The specification of the patent application in suit characterizes the porous metal wall portions of the Tornblom device:

> " . . . In the illustrated fixture such means comprises *a rigid porous metallic disk or plate* 79 unitary with each of the handhole plugs 38, 58 and 70. Each of the disks 79 is of appropriate thickness to withstand the sharp rise in pressure within the fixture incident to an explosion, due, for example, to arcing in one or more of its various electrical components. Such pressure can be quickly equalized with that of the surrounding atmosphere via a plurality of *tortuous flame arresting paths defined within* the porous structure of the disk metal itself." (App. 12, Emphasis supplied).

Authority hardly need be cited for the established proposition that claim terminology is to be read and interpreted in the light and context of the accompanying specification:

> "It is also true that claims must read in the light of the specification, not to enlarge them, but to ascertain their meaning and the intention of the patentee with respect to them." *Smith* v. *Kingsland, Com'r. Patents,* 85 App. D.C. 284, 286; 178 F. 2d 26, 28 (1949).

Taken in the context of the specification, as quoted above, the terms "rigid pervious wall of porous metal" can mean only that such metal has a "plurality of tortuous . . . paths defined within" it, and not "wire gauze" akin to a window screen.

The "Rigid Pervious Wall of Porous Metal" is a Term of the Art

Mr. Skrydlak, the expert in this art, characterized the "rigid pervious wall of porous metal":

> "A. Yes, sir, and also the fact that in your porous rigid metal, your holes are not straight and continuous through the device. It makes a sort of zig-zag affair." (App. 98)
>
> * * *
>
> "A. Well, there are thousands, or I wouldn't know how many of minute little holes, which will pass right through this porous metal. It is as if you had a bucket of golf balls, and you bonded the ends which are adjacent to each other, and you pour a bucket of water into the bucket of golf balls, the water will seep from the top right out the bottom. This acts the same way, but they are very minute." (App. 87)
>
> * * *
>
> "Q. Does the wire gauze [element W of Gover] have any rigidity? A. Well, about as rigid as your wire screen is on your household screening."
>
> "Q. Would it be possible or easy to poke a screwdriver through it? A. Very easy."
>
> "Q. Do you find anything in the Gover patent concerning a rigid porous metallic panel? A. No, sir." (App. 99)

To one familiar with this art, the terms "rigid, pervious porous metal" convey the meaning of a metal having minute *"zig-zag"* passages therethrough. And that is the meaning which should be given to those terms.

> " . . . patents are not to be read with the attention focused solely upon an unabridged dictionary and an English grammar. The purpose of a patent is to disclose the invention described therein to the public, that is, to *that part of the public skilled in the art* to which the patent appertains, and hence *they are to be read as those conversant with the art would read them.*" (Emphasis supplied). *Standard Duplicating Machines Co., Inc.* v. *American Business Machines Corp.*, 174 F. 2d 101, 105 (CA 1, 1949).

The witness Skrydlak indicated that in his opinion as one conversant with the art:

> " . . . A rigid porous element as I have encountered in the field, in explosionproof devices, is a different idea than wire gauze or screen. They are entirely different materials and substances". (App. 97)

This Court can and should reach the same opinion for if the terms of claim 16 denote to those skilled in the art a metal having minute "zig-zag" passages, those terms obviously cannot embrace wire gauze or screening, which the Court knows to have direct openings therethrough.

The District Court Clearly Erred in Disregarding the Factual Record in Interpreting Terms of Art

The District Court backed away from the question of terminologoy "finding" only that:

> "8. In view of the Keil patent disclosure, the provision of an electric lamp fixture with a casing composed of both impervious parts and a rigid pervious wall of porous metal would have been obvious. . . . Claim 16, therefore, does not define invention." (App. 182)

Keil, however, shows wire gauze material, *not* "a rigid pervious wall of porous metal" within the meaning of those terms taken, as they must be, in the compelling context of the specification and with the meaning they have to those "conversant with the art".

The District Court refused to find directly on the issue whether or not

> "8. There (is) (is not) credible undisputed testimony in the record of this action that 'a rigid pervious wall of porous metal' as recited in claim 16 has a particular meaning to one skilled in the art, and is a metal so formed as to have a great number of small zig-zag passages extending through the thickness of the metal. The 'wire gauze' referred to in the disclosures of the Williams . . . Keil . . . and . . . Gover . . . [patents] (is not) [or is] in this art 'a rigid pervious wall of porous metal' ". (Motion Under Rule 52(b); App. 187).

On the record, it could only have found in the affirmative for the first sentence, and in the negative for the second sentence. Had it found on these relevant basic fact questions, its ultimate "finding" No. 8 would have been, and is, totally unsupportable. The language of claim 16 in issue does define a fixture patentably distinct from the prior patents.

CONCLUSION

We respectfully submit that, on this record and under the controlling points of law, this Court can only be "left with the definite and firm conviction that a mistake has been committed". The judgment of the District Court should be reversed.

Respectfully submitted,

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CHAMBERS OF JUDGE BAZELON

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BRIEF FOR APPELLEE

United States Court of Appeals
FOR THE DISTRICT OF COLUMBIA CIRCUIT

APPEAL No. 13,985

APPLETON ELECTRIC COMPANY, APPELLANT

v.

ROBERT C. WATSON, COMMISSIONER OF PATENTS,
APPELLEE

APPEAL FROM THE JUDGMENT OF THE UNITED STATES DISTRICT COURT FOR THE DISTRICT OF COLUMBIA

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United States Court of Appeals
For the
District of Columbia Circuit
FILED SEP 20 1957
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STATEMENT OF QUESTIONS PRESENTED

The appellee disagrees with appellant's "Statement of Questions." In the opinion of the appellee, the questions presented are:

1. Whether the District Court was clearly wrong in holding that claim 16 of the application in issue does not distinguish, in a patentable sense, from the lighting fixture shown in the patent to Keil, No. 489,150;
2. Whether the District Court was clearly wrong in holding that, in view of the known effectiveness of sintered metal panels as explosive flame arresters, as taught by the Baker patent No. 2,447,048, it would not be inventive to substitute such a panel for the wire gauze flame arrester of any of the fixtures shown in the patents to Williams, No. 321,166 or Keil, No. 489,150 or the British patent to Gover *et al.*, No. 23,369; and
3. Whether the District Court was clearly wrong in holding that it would lack invention, in view of the patents to Baker, Williams or Keil, to provide compartmented lamp casings of the type shown by the patents to Tornblom, No. 2,392,202, and Bissell *et al.*, No. 2,476,352, with closures embodying rigid porous metallic panels.

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v.

ROBERT C. WATSON, COMMISSIONER OF PATENTS,
APPELLEE

APPEAL FROM THE JUDGMENT OF THE UNITED STATES DISTRICT COURT FOR THE DISTRICT OF COLUMBIA

BRIEF FOR THE COMMISSIONER OF PATENTS

INTRODUCTION

The appellant here seeks review of a decision of the United States District Court for the District of Columbia (App. 183 *) dismissing the complaint (App. 1) in an action under Section 145 of Title 35 of the United States Code. In the action, as brought, Nils A. Tornblom, applicant, and the appellant, Appleton Electric Company, assignee, sought to have the Court authorize the issuance of a patent on Tornblom's application, Serial No. 789,444, including claims 14, 15, 16, 18 to 23 and 25 therein. In view of the death of Nils A. Tornblom subsequently to the commencement of the action, he was removed as a party plaintiff upon motion of the appellant Appleton Electric Company (App. 62). Claims 14, 15 and 25 were withdrawn by appellant at the trial (App. 62). The allowance of claims 16 and 18 to 23 was refused by ~~the District~~ Court, and the Patent Office, by reason of the failure of those claims to define invention over the prior art.

---

* References to the Joint Appendix filed with the appellant's brief are indicated "App.   ."

COUNTER-STATEMENT OF THE CASE

Since the "Statement of the Case" beginning on page 22 of appellant's brief is incomplete in some respects, and includes argumentative matter, a counter-statement of the essential facts is deemed necessary.

APPELLANT'S APPLICATION AND CLAIMS

The application here involved discloses a lamp fixture for use in explosive atmospheres. As shown in the application drawing (App. 17, 18, 19) the lamp is of the fluorescent type, the lighting elements being shown at 12. The fixture is divided into compartments having gas-tight seals therebetween. One compartment is formed by tubes 18 surrounding the fluorescent elements and upper casing 14. A terminal chamber 50 is separated therefrom by seals, such as 74. The compartments are provided with access handholes having screw-in closures, as at 38, 58 and 70. The closures are provided, as a feature upon which appellant bases its claim of patentability, with plates 79 made of sintered metal. Such plates readily permit the passage of gas, but have such a cooling effect on the gas as to prevent the passage of flame. Flame from an explosion caused by a spark within one of the fixture's compartments will, therefore, be contained within the fixture and not communicated to the combustible atmosphere in the room in which the lamp is used.

As indicated on page 7 of appellant's brief the claims fall into three groups. The first group consists of claim 16 which reads as follows:

> "In an electric lighting fixture, an explosion-proof fixture casing enclosed partially by a solid impervious wall having a detachable portion and partially by a rigid pervious wall of porous metal integral with said detachable portion of said impervious wall."

The significant words in this claim are those defining the flame arresting element as "a rigid pervious wall of porous metal."

The second group consists of claims 18 and 19. Claim 19, the broader of the two, reads as follows:

> "An electric lighting fixture characterized by an explosionproof casing having a threadedly detachable solid wall portion integrally bonded to a rigid sintered metallic wall panel."

This claim, then, raises the question whether it was invention to use, as a flame arrester in a lamp fixture, "a rigid sintered metallic wall panel."

Claims 20 to 23 constitute the third group, and, as indicated by claim 20 set out below, call for sealed compartments in the fixture having access to the atmosphere by "rigid porous metallic panels."

> 20. "In an explosionproof lighting fixture having an internally partitioned casing including a pair of chambers sealed each from the other against the passage of gas therebetween, said chambers having electrical components therein and access openings to the exterior of said fixture, the combination comprising closure members for said access openings, and rigid porous metallic panels unitary with said closure members, said panels being adapted to dissipate gas pressure resulting from internal explosions within said chambers while arresting the passage of flame therefrom."

THE PRIOR ART VENTED FIXTURES

Beginning on page 3 of its Brief, under the title "Prior Explosionproof Electric Fixtures," appellant indicates that prior efforts to make explosionproof fixtures proceeded along two lines, (1) maintaining a higher-than-atmospheric pressure in the lamp housings to prevent the infiltration of explosive gas and (2) the use of heavy walls in the fixtures to contain any explosion which took place.

Appellant does not, in this review of prior efforts, mention a third line of development work, of more pertinency than the other two in this proceeding, as represented by the patents to Williams, Keil, and Gover *et al.* These patents demonstrate that it was long ago suggested that lamps and electrical fixtures be "vented" by flame arresting screens to prevent ignition of a flammable atmosphere.

The lamp shown by Williams, No. 321,166 (App. 20), constitutes an improvement of safety lamps of the "Davy" type for use in mines. In the Williams lamp, light is furnished by a flame at a^1. The flame is enclosed within a wire screen cylinder C and, if the top of the cylinder should burn out, diaphragm G, held in place by screw member c^5, gives additional protection. As indicated in plaintiff's Exhibit 9 (App. 163, 164), a lamp of the "Davy" type may be "taken with impunity" into an explosive atmosphere, because the atmosphere passes through the screen and burns inside. The wire cylinder, however, by its cooling effect on the burning gases, acts as a flame arrester and prevents an explosion.

The Keil patent, No. 489,150 (App. 23), shows an electric lamp fixture in which the lighting element b is enclosed within a wire screen cylinder g in order that, "in case of the breaking or cracking of the bulb all fear of the igniting of any dangerous gases within the mine, will be precluded" (App. 24, col. 1, lines 16 to 19). More specifically Keil states:

> "In case the lantern body should be crushed by any severe accident happening thereto by which the bulb would be cracked or broken, and cause the ignition of any gases which might be within the lantern body by the spark of the incandescent light all liability of ignition of surrounding gases so as to cause an explosion, would be prevented by the gauze body of the lantern, so that the liability of the ignition of the gases is precluded under any circumstances."

Gover *et al.,* British patent No. 23,369 (App. 26), discloses an electric fuse for use in a combustible atmosphere, having a casing which is vented to the atmosphere by a wire gauze W. The latter is said (App. 26) to "give a free outlet for gases under pressure but will prevent communication of the flame to the exterior."

THE BAKER PATENT

The patent to Baker, No. 2,447,048 (App. 33), was issued August 17, 1948, on an application filed in the Patent Office January 15, 1944. Thus, the Baker patent was not available as a publication in the explosion preventing art for some months after the Tornblom application was filed (December 3, 1947). Baker discloses that a sintered metal panel 15 may be used as a backfire arrester in combustible gas systems, such as blowpipes. The panel is made by sintering together bronze metal particles (App. 34, column 2, lines 40 to 42) resulting in "tortuous interconnected pores of a small size capable of extinguishing a backfire flame" (App. 35, column 1, lines 47 to 49). In Figure 1 of Baker, the flame of an explosion or backfire in the outlet part of the system (to the right of element 14) would be prevented by element 15 from causing an explosion in the combustible gas supply (to the left of element 13). The Baker disk is made of the same material as appellant's flame arrester (App. 112). As an improvement, Baker uses a metallic flame distributor 20.

THE PRIOR ART COMPARTMENTED FIXTURES

Extended discussion of the Tornblom and Bissell *et al.* patents (App. 28 and 36) is unnecessary. These patents were cited to show that it is old to provide lighting fixtures of the same general type as appellant's, with compartments to seal off certain parts of the lamps from others, such structure being recited in claims 20 to 23. It is not understood that appellant contends that Tornblom and Bissel *et al.* are not adequate to the purpose for which they were cited.

SUMMARY OF ARGUMENT

The Trial Court permitted sufficient testimony concerning the qualifications and prior experience of the witness, Mr. Skrydlak.

The Trial Court did not indicate that it would not hear more than one expert on the alleged inoperability of the "Davy" lamp. Rather, the Court indicated that more than one expert was unnecessary on the *Baker* patent, which was not alleged by appellant to be inoperative. The evidence, moreover, did not tend to show that the "Davy" type lamp was inoperative.

There is no authority for the appellant's apparent view that the Trial Court was under a duty to make findings on every point considered by it. The authorities indicate that the findings of the Trial Court should be the ultimate facts which provide a basis for the decision. The findings requested by the appellant were properly refused by the Trial Court, since they related to matters which the Court, under the authorities, could properly have held to be irrelevant or immaterial to the decision.

Except for the limitation "rigid pervious wall of porous metal," claim 16 differs from the Keil patent device in immaterial respects only. The Keil wire gauze flame arrester was admitted by the appellant's witness to be "porous" and it obviously has a degree of rigidity. Claim 16, therefore, does not differ patentably from the Keil device. Appellant's contention that claims are to be interpreted in the light of the specification applies to patents. Claims in application for patents are to be given the broadest interpretation of which they are reasonably susceptible.

Claims 18 and 19 define the flame arrester as a "rigid sintered metallic" panel. The Baker patent discloses the use of such a panel as a flame barrier between an explosive atmosphere and a device in which an explosion may take place. Since Williams, Keil and Gover *et al.* suggest the basic idea of a vented enclosure having a flame arrester, it would be within the skill of the art to improve any one of those devices by substituting therein the flame arrester of Baker.

The shortcoming of the Williams, Keil and Gover *et al.* devices was known to be the ineffectiveness of the flame barrier in violent explosions. Prompt adoption of a sintered metal panel by Tornblom suggests only that he took advantage of the known characteristics of a new material. This does not constitute invention. Contrary to appellant's assertion, it seems apparent that gases, under backfire pressure, do pass through Baker's sintered panel. However, whether do or not is immaterial.

The evidence does not show that the owners of the Baker patent were engaged in the design of explosion-proof lamps, nor does it indicate that they had actual knowledge of the prior art vented lamp enclosures. That they failed to adapt the Baker panel to a lamp casing is, therefore, immaterial.

Claims 20 to 23 differ from claims 16, 18, and 19 only by calling for compartments in the fixture casing. Appellant seemingly makes no contention that these claims present any different issue of patentability than claims 16, 18 and 19.

ARGUMENT

The appellant, on pages 19 to 22 of its brief, raises two points which are not believed properly to be issues in the case. These points will be dealt with before proceeding to the issues raised by the claims, as outlined in the appellee's Statement of Questions Presented.

The Record Does Not Support Appellant's Contention That the Trial Court Improperly Refused to Admit Evidence

Appellant contends first that the Trial Court refused to listen to qualifications of its witness, Mr. Skrydlak, as "an eminent expert in the art of explosionproof fixtures * * " (Appellant's Brief, page 19).

The record of Mr. Skyrdlak's testimony (App. 64 to 66) shows that he was asked, and was permitted to answer some 12 questions concerning his qualifications and his experience at Underwriters Laboratories. His testimony established that he is a lawyer, admitted to practice in Illinois and before the Patent Office, that he is a chemical engineer, that he had been employed as such by Underwriters Laboratories, and that he did testing work at Underwriters in the field of explosionproof lighting fixtures. This testimony would seem sufficient, on its face, to accomplish the appellant's expressed purpose. It was certainly sufficient insofar as the Trial Judge was concerned. He expressly held that " * * * the Court is accepting him as an expert" (App. 66).

The record, accordingly, seems to furnish no support for appellant's statement that the Court " * * * shut its mind to the high degree of experience and authority * * * " of the witness (Appellant's Brief, page 20). On the contrary, the Court accepted him as an expert.

Appellant's further contention (Brief, page 20) that " * * * the Court below refused to allow more than one witness expert in the art * * * " is similarly without support in the record. The discussion between appellant's counsel and the Court on this point (App. 118) was as follows:

> "The Court: What will the other witness' testimony be about?
>
> Mr. Osann: The other will testify about certain aspects of the Baker patent.
>
> The Court: No, I won't hear two experts on the same point. You have had Mr. Skyrdlak on the Baker patent.
>
> Mr. Osann: Your Honor, this will be a fact witness. He is connected with the company that had the Baker patent.
>
> The Court: How long will his testimony take?
>
> Mr. Osann: A matter of five minutes.
>
> The Court: Very well."

This discussion, it will be noted, was limited to the *Baker* patent concerning which appellant made no contention of inoperability. The Trial Judge was concerned only with evidence as to alleged inoperability of the *Davy* lamp (Williams patent No. 321,166) when he later stated (App. 140):

> "Well, I am not going to make any findings on the basis of one witness to the effect that the Davy lamp is unsafe, because it has been in use in mines ever since 1880. I want more proof before I make a finding that it is unsafe."

In asserting that he would hear only one expert, it is apparent that the Trial Judge had reference to testimony of the type offered in connection with Baker, i.e. how the device operated. He did not exclude, and there is no reason to infer that he would have excluded the testimony of a further witness as to the operability of a device which has been used successfully by the public for many years. No such witness was ever, in fact, brought forward, nor does the record indicate that the appellant ever intended to produce one (App. 118).

To clinch the matter, it does not appear that appellant presented evidence intended to show that the Davy lamp was unsafe, if used as disclosed in Williams. Thus, a corroborating witness, if produced, would have had nothing to corroborate. So much is indicated by the following exchange (App. 94):

> "Q. If you carry a lighted Davy safety lamp into an area where there are explosive mixtures of gas, why is it that the Davy safety lamp will not cause an explosion? A. Because, as I mentioned before, if it is brought in while it is lit, the gases will pass through the screen and will be consumed by the flame at the wick, and the wire screen at that time is sufficiently broad and having enough metal and mesh of sufficient size to cool the flame and prevent the ignition of the explosion mixture in the area."

As previously noted, plaintiff's Exhibit 9 establishes that the Davy lamp "may be taken with impunity" into hazardous atmospheres (App. 164).

The record establishes that the statement to the Court by appellant's counsel that "the Davy lamp was stated to be unsafe to be lit" (App. 140) was inaccurate. The Court's holding that such an assertion would need ample corroboration, would seem entirely proper.

The Trial Court Properly Refused to Make Findings Not Essential to Its Decision

Beginning on page 21 of its brief, appellant asserts that the Trial Court was in error in refusing (App. 197) to make findings as to (a) inoperativeness of certain of the references, (b) what the Baker patent in fact taught engineers of the company that owned it, and (c) the advances in the art contributed by the application device.

In so contending, appellant seems to take the view that the Trial Court was under some duty to make findings on every point considered by it. No authority is cited to support such a contention and none is known.

To the contrary, there would appear to be ample authority for the Court to make findings only as to those matters which are essential to the decision made. "The finding should be 'a clear and concise statement of the ultimate facts, not a statement, report, or recapitulation of evidence from which such facts may be found or inferred'. *Anglo-American L.M. & A. Co.* v. *Lombard,* 8 Cir., 132 F. 721, 734; *Becker* v. *Evens & Howard Sewer Pipe Co.,* [8 Cir., 70 F.2d 596, 598] * * *," *McGee* v. *Nee,* 113 F.2d 543, 546. That this Court is similarly of the view that findings should be confined to the "ultimate facts" would seem to be indicated by the following statement in *Schilling* v. *Schwitzer-Cummins Co.,* 79 U.S. App. D.C. 20, 142 F.2d 82:

> "The ultimate test as to the adequacy of findings will always be whether they are sufficiently comprehensive and pertinent to the issues to provide a basis for decision, and whether they are supported by the evidence."

The Trial Court in this case, therefore, acted properly in refusing to make findings as to any evidence which it considered immaterial or irrelevant to the ultimate conclusion reached.

In accordance with that rule, there would seem to be ample basis for refusing findings of the three types urged by the appellant. The inoperability of a reference device, for example, does not necessarily outlaw it as an anticipation. This Court held in *Gilbert et al.* v. *Marzall,* 87 U.S. App. D.C. 1, 182 F.2d 389 that:

> "* * * the inoperativeness of a machine as a whole, even if established, could hardly serve to render each and every portion of the machine * * * worthless as a disclosure of a new and useful application of an art."

In the same vein, it held in *Otis* v. *Marzall,* 88 U.S. App. D.C. 332, 189 F.2d 653, that although the reference device in that case "may have been inefficient or actualy inoperative, it taught lessons which have now come to fruition * * *." It seems apparent that the inoperativeness of a reference device may properly be considered immaterial to patentability. Hence, the Trial Court in this case was not compelled to make findings as to inoperability of the references, even if the evidence had been effective in that respect.

Similiarly, the *actual* suggestive effect of the Baker patent on its owners has no direct bearing on what the patent *should* have taught experts in the art. Section 103 of Title 35 of the United States Code provides that a patent may be refused "if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole *would have* *been obvious"* to one ordinarily skilled in the art. Further, as discussed hereinafter, it does not appear that the Baker patent owners were active in the art of designing explosionproof electric lamp fixtures.

It was, moreover, within the Court's authority to consider evidence as to the advantages of Tornblom's fixtures to be immaterial to the issues decided. This Court has repeatedly followed the rule, as stated in *Millard* v. *Watson,* 92 U.S. App. D.C. 272, 207 F.2d 212, that:

> "* * * the problem is whether the change which the appellant wrought in the method was of such nature as to amount to invention, even if the highly desirable results he pictures did take place."

Similar holdings were made in *Clarkson Mfg. Co.* v. *Marzall,* 90 U.S. App. D.C. 210,194 F.2d 892, and *Akerlund* v. *Marzall,* 90 U.S. App. D.C. 265, 195 F. 2d 773.

It seems apparent that the Trial Judge was obliged to make only those findings which were essential to his decision. The findings requested by appellant are believed to have been properly refused.

Claim 16 Is Anticipated, in a Patentable Sense, by the Keil Patent

As pointed out hereinbefore, the significant words in claim 16 are those which define the flame arrester as "a rigid pervious wall of porous metal." As for the remainder of the claim, Keil (App. 23) indisputably shows "an electric lighting fixture" which purports, at least, to have "an explosion proof fixture casing." The casing is made up of "a solid impervious wall" having "detachable" portions m, d^1, d, e and h. The flame arrester element, while not technically "integral" with the solid parts, is functionally so, since an upper flange thereof is clamped between parts d and d^1. If claim 16 defines invention over Keil, it is by its definition of the flame arrester as "a rigid pervious wall of porous metal."

Ascribing to these words their ordinary meaning, it seems clear that they are, individually, of such scope as to apply to a wire screen of the type shown in Keil. The Board of Appeals pointed out that "porous metal" does not exclude wire gauze and, further, that the latter has "at least some rigidity" (App. 58). Appellant's witness Mr. Skrydlak agreed, when asked if a wire screen is porous, that "well, yes, it is porous" (App. 111), and he admitted that it would be "about as rigid as your wire screen is on your household screening" (App. 99). In view of his further admission that rigidity is a matter of degree (App. 111) the witness would seem to have confirmed the Board's view that "such material * * * has at least some rigidity."

Appellant is not understood to have raised any question as to the remaining words in the phrase. A wire screen answers to the definition of "pervious" as "admitting passage" of gas (Webster's New Collegiate Dictionary, G. & C. Merriam Co., Springfield, Mass., 1949) and, as shown in Keil, the screen constitutes a "wall."

It seems to be appellant's view, however, that the phrase in question should be assigned a special meaning as a "Term of the Art" (Appellant's Brief, page 41) and because the "Characterization of Claim 16 Terms in the Specification Cannot be Ignored" (Appelant's Brief, page 40). It is further asserted (Appellant's Brief, page 40) that "Authority hardly need be cited for the established proposition that claim terminology is to be read and interpreted in the light and context of the accompanying specification * * *."

If it is appellant's position that the claims in a pending application are to be assigned a special meaning, authority is indeed necessary to overcome the many leading decisions to the contrary. The accepted view as to *application* claims was clearly defined by this Court in *In re Carr,* 54 App. D.C. 270, 296 Fed. 1017, as follows:

> "After a patent has issued, and it no longer is possible for the patentee to control the phraseology of his claims, the courts will so interpret them, if possible, as to protect him; but there is no reason, as we many times have observed, why an applicant in the Patent Office should not draw his claims to cover his actual invention only. For this reason, we have uniformly ruled that claims will be given the broadest interpretation of which they reasonably are susceptible. This rule is a reasonable one and tends not only to protect the real invention but to prevent needless litigation after the patent has issued."

The United States Court of Customs and Patent Appeals has consistently taken a similar position as indicated by the decisions in *In re Garcia,* 23 C.C.P.A. 1065, 82 F. 2d. 711; *In re Kendall,* 36 C.C.P.A. 975, 173 F. 2d. 359; *In re Berliner,* 39 C.C.P.A. 928, 195 F. 2d 918; *In re Kebrich,* 40 C.C.P.A. 780, 201 F. 2d. 951; and *In re Twomey et al.,* 42 C.C.P.A. 742, 218 F. 2d. 593.

The case of *Smith* v. *Kingsland,* 85 U.S. App. D.C. 284, 178 F. 2d. 26, relied on by appellant, makes no holding contrary to *In re Carr,* supra. The language quoted by appellant from the Smith case (Appellant's Brief, page 41) related, as indicated by the quotation itself, to claims in a *patent.*

The rule that the terms of a claim shall be given the broadest interpretation of which they reasonably are susceptible, should be followed, and testimony by appellant's witness Skrydlak should be held ineffective to alter the clear meaning of the phrase in question. "The word 'overlapping' has a common well understood meaning. Extrinsic evidence from an expert witness for the appellee giving a different meaning to the word is, of course, not binding on the Court, and can be disregarded," *Thabet Mfg. Co.* v. *Koolvent Metal Awning Corp. of America,* 226 F. 2d 207.

If, indeed, it is essential to the patentability of claim 16 that it defines a flame arrester having " 'plurality of tortuous * * * paths defined within' it, and not 'wire gauze' akin to a window screen" (Appellant's Brief, page 41), it is fatal to the claim that the flame arrester is not described in those terms. As held in *In re Berliner,* 39 C.C.P.A. 928, 195 F.2d. 918:

> "The particular feature or fact upon which an applicant predicates patentability must not only be disclosed in the specification but also brought out in the claims."

It Would Be Within the Skill of the Art to Substitute the Improved Flame Arrester of Baker for Those Shown by Williams, Keil and Gover et al.

Claims 18 and 19 differ from claims 16 in that they define the flame arresting element with greater particularity as "a rigid sintered metallic" panel. The Williams, Keil, and Gover *et al.* devices do not have "sintered metallic" flame arresters. It is believed apparent, and appellant would seem to agree, that they are not otherwise deficient as anticipations.

Tornblom's basic contribution, reduced to its essentials as in claims 18 and 19, may be said to be a modification of the "Davy" type fixtures of the prior art, by the employment of a new and improved flame arresting material. The crux of the matter is whether it required "uncommon talent" (*Standard Oil* v. *Marzall,* 86 U.S. App. D.C. 210, 181 F. 2d 280) to substitute a sintered metal panel for the wire screen, such as was used in the prior art devices, as an improved means to arrest explosive flame.

The District Court held (Finding of Fact No. 9, App. 183) that the Baker patent (App. 33) would suggest such a substitution. Baker employed the same material as is disclosed by Tornblom (App. 112) as a backfire flame arrester. In conformance with the testimony of Mr. Skrydlak (App. 87), Baker states that a sintered metal panel has "tortuous interconnected pores" which are "capable of extinguishing a backfire flame" (App. 35, column 1, lines 47 to 49). A backfire, as is common knowledge, is an explosion of some violence, a fact which was corroborated by Mr. Skrydlak (App. 101). The suggestive force of Baker in the explosion-proofing art is indicated in the following excerpt from the Transcript (App. 101):

> "Q. Then it would be fair, wouldn't it, to say that Baker would suggest that a sintered metal disk would be effective as a flame barrier between an explosive atmosphere and a device in which an explosion may take place?

* * * * *

A. Yes, it could be used as a barrier."

It seems apparent that a lamp designer, seeking an improved explosionproofing means, would find in the prior art everything needed to produce the device of claims 18 and 19, and a definite suggestion to proceed in that direction. Williams, Keil and Gover, et al., contributed the basic concept of a "vented" enclosure, the vent constituting an arrester for flames or explosions occurring within the enclosure. Baker suggests an improved material for the flame arrester, which is effective for flames propelled with "backfire" force. The evidence is believed to furnish ample basis for the lower court's finding that claims 18 and 19 call for nothing which the prior art does not suggest.

None of the objections raised by appellant to the District Court's position is believed to have merit. Much is made of certain tests (App. 165, 167) as demonstrating that wire screens are ineffective to prevent the propagation of explosions of certain types. It is said that workers in the art would, thus, be prompted to avoid vented fixtures (Appellant's Brief, page 23).

Such reasoning ignores the fact that wire screen flame barriers were not entirely ineffective. The difference between an explosion and a flame is only one of degree, depending on the rate of combustion (App. 111), and wire screens were known to have an adequate cooling effect on flames which were not propagated too forcefully (Plaintiff's Exhibit 9, App. 163; Testimony, App. 95). Thus, the defect in the "Davy" type devices was not in their principle of operation, but in the effectiveness of the flame barrier. If they were demonstrably inoperative under highly explosive conditions, the demonstration itself would indicate where the deficiency lay, in the ineffectiveness of the flame barrier.

The art, accordingly, would not be led away from the "vented" enclosure principle, but would be led to seek a more efficient flame arresting substance, one which would be effective for explosive flames. Promptly upon the presumptive disclosure of such a material to the art by Baker, Tornblom adapted it to a vented enclosure. There is no invention in using a new material to take advantage of its known properties, *Pollard* v. *American Phenolic Corp.*, 219 F. 2d 360; *In re Ankney,* 40 C.C.P.A. 1059, 204 F. 2d 957; *In re Krogman,* 42 C.C.P.A. 1037, 223 F. 2d 497.

Appellant seems to argue that a device which is inoperative can have no anticipatory effect. This is not the rule in this jurisdiction, as indicated by the previously quoted excerpts from *Gilbert et al.* v. *Marzall, supra,* and *Otis* v. *Marzall, supra.*

Appellant's objection to Baker (Appellant's Brief, page 31) on the ground that flame barrier 15 in the patented device does not vent explosive pressures, is believed to be both inaccurate and immaterial to the issues. The sole function of the sintered panel in Baker is to extinguish the flame in gases forced through it. Unless the Baker panel vents explosive pressures, there would be nothing to force the flame thereagainst for extinguishment. Thus, any contention that the Baker panel 15 does not pass gases under pressure would seem to run counter to the disclosed operation of the device.

Even assuming gases are not passed through the disk, it is clear that the nature of the disk is such that they would be so passed if forced in that direction. Since the Baker disk has the disclosed properties of an effective, pervious flame arrester, how it actually operates in Baker would seem to be of little moment.

That the owners of the Baker patent did not develop a vented explosionproof lamp is similarly immaterial to the issue. Failure of others to produce an innovation proves nothing as to obviousness, unless it is shown that those charged with such failure had knowledge of all of the pertinent prior art and were actually working on the problem, *Toledo Pressed Steel Co.* v. *Standard Parts, Inc.*, 307 U.S. 350; *Lindberg Engineering Co.* v. *Ajax Engineering Co.*, 199 F. 2d 807; *Folkins et al.* v. *Watson,* 129 F. Supp. 362, affirmed 96 U.S. App. D.C. 55, 223 F. 2d 347. It was a prerequisite to the decision in *Lucke* v. *Coe,* 63 App. D.C. 61, 69 F. 2d 379, relied on by appellant (Appellant's Brief, page 38), that "All the patents relied upon by the Patent Office as anticipating Lucke's device were before these engineers * * *."

It would seem sufficient, in this case, to point out that no part of the testimony by Mr. Jacobsson, representing the owners of the Baker patent, indicates that engineers of that company (1) had any knowledge of the Williams, Keil or Gover *et al.* patents or any other disclosure of a vented lamp enclosure, or (2) were engaged in the design of explosionproof lamps.

Finally, in an attempt to show non-obviousness, appellant suggests (Appellant's Brief, page 38) that the Baker patent was "available to the industry." The record includes no evidence that the Baker patent was available to the industry prior to its issue date, August 17, 1948, which was after Tornblom applied for a patent on December 3, 1947. Since Tornblom made no claim of inventing the sintered metal material itself, the facts imply that he adapted it to an obvious use promptly upon its development by another.

Claims 20 to 23 Are Unpatentable Over Tornblom or Bissell et al. in View of Baker, Williams, or Keil

Claims 20 to 23 would seem to call for adjudication of no issue not already considered in connection with claims 16, 18 and 19. Claims 20 to 23, in essence, call for compartmented lamp casings of the type shown by the patents to Tornblom (App. 28) and Bissell *et al.* (App. 36) in which a part of the casing is a "rigid porous metallic" panel.

Appellant does not appear to contend that his lamp is inventive by reason of the "compartmented" feature. This being the case, the issue is essentially the same as in connection with claim 16, i.e., whether Williams and Keil show lamp fixtures having a "rigid porous metallic" panel. For the reasons advanced in connection with claim 16, it is submitted that they do.

If a more restricted interpretation were applied to those words, Baker indisputably shows a panel 15 of the required type. The question then becomes the same as that discussed in connection with claims 18 and 19: whether it was clearly wrong to hold that Baker would suggest the claimed improvement in prior fixtures.

CONCLUSION

For the reasons given, it is submitted that error has not been shown in the decision of the District Court. Its decision in this case should, accordingly, be affirmed.

Respectfully submitted,

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REPLY BRIEF FOR APPELLANT

IN THE

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DISTRICT OF COLUMBIA CIRCUIT

United States Court of Appeals
For the
District of Columbia Circuit
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Appeal No. 13,985

APPLETON ELECTRIC COMPANY, *Appellant*,

v.

ROBERT C. WATSON, Commissioner of Patents, *Appellee*.

Appeal from the Judgment of the United States District Court for the District of Columbia

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IN THE

United States Court of Appeals

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Appleton Electric Company, *Appellant,*

v.

Robert C. Watson, Commissioner of Patents, *Appellee.*

Appeal from the Judgment of the United States District Court for the District of Columbia

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REPLY BRIEF FOR APPELLANT

INTRODUCTION

The Appellee's Brief fails to meet each issue head-on. Some of the statements are unsupported by the record, and the case law relied upon in many instances is applicable only to fact circumstances which are not found in the present case. This Reply is drawn to clarify the facts, the issues, and the applicable rules of law.

The Appellee's Statement of Questions Seeks to Avoid The Essential Considerations

Appellee has presented his own statement of questions, a statement which is not particularly informative of the questions presented. In appellant's brief, we attempted to define the focal issues of the appeal, not merely state the question whether the trial court should be reversed, as appellee has done.

The questions presented by appellee, especially question No. 2, lie on incorrect factual premises. In question No. 2, appellee assumes as fact that wire gauze is a flame arrester by using the phrase "the wire gauze flame arrester". The record shows, without contradiction, the factual premise is wrong (Appellant's Brief, pages 23-27).

The Appellee's Statements Regarding the Prior Art References are Misleading

Appellee (his brief, page 4) asserts we omitted mention of a "third line of development work" in electric explosion-proof fixtures. The assertion that there is a "third line of development work" is nonsense. The Williams patent referred to by appellee is not a line of development of electric fixtures; it burns fuel in a flame (Appellee's Brief, bottom of page 4). The electrified Davy lamps suggested by the Keil and Gover patents are developments in bombs, not safety devices (Appellant's Brief, pages 24-26).

Appellee seeks refuge in quotations of statements made in the Keil and Gover patents as to the operation of electrified Davy lamps (his brief, page 5). The facts, uncontroverted on this record, belie and rebut those statements (Appellant's Brief, pages 24-26). The statements quoted by Appellee are wrong to the point of being dangerous. Indeed, it might be wise to place the Keil and Gover patents in a special category in the Patent Office lest some unsuspecting person rely on them.

Appellee's further contention that the Davy Lamp, either fuel-burning or electrically illuminated, suggests the Tornblom "vented type" electric fixture, likewise falls before the facts. The fuel-burning Davy lamp does not in any sense compare in principle or operation to the Tornblom fixture. *It depends entirely on a continuous, open flame to burn explosive gas in small quantities to consume explosive gases and prevent them from accumulating* (Appellant's Brief, page 23). In fact, the screen of the Davy lamp, exemplified here by the Williams' patent, is not *flame arresting*. Wind or a "sudden draught" blows the flame *through* the wire gauze or screen and would ignite an explosive mixture outside of such screen (Ganot's Physics, App. 164).

POINTS OF ARGUMENT

I. WHATEVER THE REASON, THE TRIAL COURT'S FAILURE TO ADMIT THE OFFERED TESTIMONY IS ERROR

The failure of the Trial Court to admit evidence offered by appellant and to make findings of fact are clear error. That failure, whether it stems from an incorrect interpretation of the invention claimed, or from clear error of fact or law, is no less fatal to the judgment entered below.

Appellee, to support the exclusion of evidence of qualifications of appellant's expert witness, Mr. Skrydlak, relies on the Trial Court's statement ". . . the Court is accepting him as an expert" (his brief, page 9).

The problem is, expert in what? Mr. Skrydlak was asked to testify in this cause, not because he was a patent lawyer or a chemical engineer, but because he was one of a relatively few people in this country who was trained and experienced in explosion proof lighting fixtures. The Trial Court was "not interested in that" (App. 65).

So, too, in the refusal to allow Mr. Jacobsson to testify as an expert for appellant, the Trial Court erred. Mr. Jacobsson eminently qualifies in the art to which the Baker patent applies, namely, welding equipment (Appellant's Brief, page 36). There was no duplication in the testimony offered. Mr. Jacobsson is expert in quite a different field than Mr. Skrydlak. Appellee here tries to make capital of the limited argument (App. 118) made by appellant's counsel in trying to put forward expert testimony by Mr. Jacobsson. It is to be recalled that counsel for appellant had been warned and admonished by the Trial Court:

> "You know, I think when the Court indicates a certain procedure that it behooves counsel to cooperate by trying to follow that procedure that the Court indicates." (App. 108).

There is no question but the appellant was entitled to present evidence by qualified witnesses of the import of the prior art patents. That was wrongfully denied appellant by the Court below.

As an example of the real and predjudicial results of that exclusion of testimony, we cited the Trial Court's comment on lack of proof as to the Davy lamp patents (Appellant's Brief, page 20). Appellee attempts to depreciate that admission by the Court of its error by saying the quoted statement of appellant's counsel was incorrect (Appellee's Brief, bottom page 11). What actually happened was that the Trial Court cut appellant's counsel off short in the middle of his argument. In any event, the proposed finding of fact (App. 187. No. 9) clearly states the fact rejected by the Court below without so much as reading it.

The Court below clearly erred in excluding evidence of the expert witnesses. The error is multiplied by the subsequent holding of the Court based on disbelief of the uncontradicted evidence presented.

II. THE REFUSAL TO MAKE FINDINGS EITHER WAY ON BASIC FACT QUESTIONS WAS ERROR; BUT AT LEAST SUCH REFUSAL CONFIRMS THAT THE ULTIMATE FINDINGS WERE MADE IN ERRONEOUS DISREGARD OF BASIC FACTS

The appellee argues (brief, p. 12) that the Court below had no duty to make findings as to (a) the inoperativeness of certain ones of the references; (b) what the Baker patent in fact taught engineers of the company that owned it; and (c) the advances in the art contributed by the device claimed in the Tornblom application.

Contrary to appellee's contention, findings of fact on these points are essential on the ultimate question of whether the claimed device was not "obvious to those skilled in the art", i.e., whether it amounts to patentable invention (Appellant's Brief, pages 28, 33, 37).

A. Inoperativeness of Reference Devices

Appellee does not face head-on the material and basic question of inoperative references. The authority cited in our Brief, pages 27-28, is conclusive on the question.

Appellee skirts the issue by citing two cases not applicable to the facts here (Appellee's Brief, page 13). The facts of those cases are discussed later in this brief. Even in these two decisions, this Court found it pertinent to treat and make findings on the presence and nature of inoperativeness of the prior art references.

The operativeness of the reference patents is clearly pertinent and subject to fact finding here. The Trial Court clearly erred in failing to find on that issue.

B. What the Baker Patent Taught in Fact

A fact issue in this case is whether or not "the differences between the subject matter sought to be patented and the prior art as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains" (Section 103, Title 35, U.S.C.).

Appellee contends that as to the Baker patent, the issue of fact presented is in terms of a subjective determination, that is, what "would have been obvious" (Appellee's brief, pages 13-14). Accepting appellee's contention, a subjective conclusion is nothing more than a guess, unless based on objective fact. The objective, proven fact here is that the Baker patent did not suggest or make the invention obvious to men who knew and used the Baker disclosure in explosive gases (Appellant's Brief, pages 31-32, 36-37).

The proofs in this case are perhaps unique in that here is proof of what actually occurred. In weak contrast is the usual testimony of an expert who expresses his opinion as to what was or was not obvious, or what a patent disclosure should have taught.

The courts have often ruled that the objective facts of "long felt" need, "searching by others", and "commercial acceptance" are material and relevant to the ultimate conclusion. *Levin* v. *Coe,* 76 App. D.C. 347; 132 F. 2d 589, 596 (1942). Those rulings indicate that objective facts on what the Baker Patent did not teach should be accorded equal force here, and point out the error committed below.

C. Advances Wrought By the Invention

Appellee argues (Brief, p. 14) that it was "within the Court's authority to consider evidence as to the advantages of Tornblom's fixture to be immaterial to the issues decided". The "issue" decided was whether the claims defined a patentable invention, i.e., whether the *differences* between what is disclosed in the valid prior art references and the invention claimed would not have been obvious to one skilled in the art.

Appellee's line of reasoning begs the question of whether or not a claimed invention would be obvious to one skilled in the art. To answer that question, the advantages wrought by the invention are looked to *first:*

> "In administering the patent law the Court *first* looks into the art to find what the real merit of the alleged discovery or invention is and *whether it has advanced the art substantially*". *Eibel Process Co.* v. *Minnesota & Ontario Paper Co.,* 261 U.S. 45, 63 (1923). (Emphasis supplied).

If one looked at the facts of the *Eibel* case, *without* evaluating the advantages and advance which the invention there in issue made possible, he would wrongly have concluded that Eibel's invention was not patentable invention. What this decision of the Supreme Court stands for, therefore, is that the advances or advantages which an invention makes possible are factors necessarily to be considered in answering the ultimate question as to whether the invention would have been obvious to one skilled in the art.

The cases cited by the appellee (His Brief, Page 14) are not in conflict with the *Eibel Process* case. In *Millard* v. *Watson,* 92 App. D.C. 272; 207 F. 2d 212 (1953), this Court took pains to list in detail the advantages allegedly flowing from the invention in question. What the Court decided, without explicitly so stating, was that these advantages were not sufficiently great, or unexpected, because the structural expedients employed were known in the prior art.

This Court has insisted upon a finding as to the advantages which an invention brings forth, making its own finding where the District Court failed to do so:

> "... The finding [No. 8 by the District Court] *fails to reflect* the facts shown by the references and evidence that the appellant's process . . . [produces] *a new result* and that it satisfies . . . a want which had long been recognized but unsatisfied in the milling art. * * * Since the facts which the finding fails to reflect *were relevant under the pertinent principles of law*

> stated above, the court *should have found them.* . . . See Rule 15(b) of the Federal Rules of Civil Procedure * * * As in our view the court could . . . have made no finding except one which reflected the facts which we have stated, it would be idle to return the case for further findings." *Levin* v. *Coe,* 76 App. D.C. 347; 132 F. 2d 589, 589 (1942). (Emphasis supplied).

The failure of the Trial Court to find *either way* on these basic facts (See Plaintiff's Motion under Rule 52(b), F.R.C.P.; App. 184) shows error, i.e., that the ultimate "findings of fact" were made in total disregard of uncontradicted basic facts.

III. CLAIM 16 IS NOT ANTICIPATED IN SUBSTANCE OR IN TERMS BY THE KEIL PATENT

The Keil patent is shown by the evidence of record to be inoperative (Appellant's Brief, p. 24-27). It has been "outlawed" as a prior reference because it does not show an operative device which corresponds in substance to Tornblom's claimed invention, as discussed later in this brief.

Appellee on pages 14-17 of his brief does not deny that Keil fails in substance to disclose a device which corresponds to Tornblom's invention.

Rather, appellee seeks to define each word individually out of a phrase in Claim 16 to suit his argument. Appellee's argument is in error on two grounds dictated not only by legal rules of interpretation but also by common sense. First, words of a technical document, whether a patent or the proceedings of a technical society, are to be interpreted as defined by the technology to which the document is directed. Second, a word or a phrase is to be considered in the setting where found. Any phrase can be fatally distorted if it is taken apart and each word considered (even according to a strict dictionary meaning) in isolation from the others and the setting of the phrase (*In Re Frederick,* 175 F. 2d 462, 466—C.C.P.A. 1949). That is what appellee asks the Court to do.

Appellee, nevertheless, asserts that the wording in the claims of a pending patent *application* is to be given the broadest interpretation irrespective of the subject matter of the claim language and the description in the application (Appellee's Brief, page 16). What appellee fails to do, as required by the authority relied upon (*In Re Carr,* 54 App. D.C. 283, 297 F. 542 [1924]), is to give the wording of Claim 16 a meaning of which it is *reasonably* susceptible (Appellant's Brief, pages 40-42). He seeks to go beyond a *reasonable* meaning of the phrase "rigid pervious wall of porous metal" as it is used in environment of the patent application and the art to which it pertains—to justify an argument that the phrase embraces wire gauze or screening material shown by the Keil patent.

As an example of what appellee seeks to do, we submit the phrase "stationary bed" as a subject for word-play. That phrase can mean a stationary stratum of base rock, a built-in piece of domestic furniture, a machine tool part, and perhaps others. Our reference to the phrase is in the claims of recently issued United States Patent No. 2,762,269, where the last meaning was intended and accepted by the Patent Office without controversy. Another illustration is the word "saddle". If that word be found in a document relating to machinery, common sense directs one to reject the idea of a trapping for a horse, or a topographical configuration of a ridge.

We do not contend, as appellee postulates, to assign a special meaning to the language of the claim. We do contend that to take individual words from Tornblom's Claim 16 out of the context in the phrase "a rigid pervious wall of porous metal" and deny the meaning they have *in the explosionproof electrical fixture art,* is nonsense. It is merely an attempt to impart to those words a meaning of which they are *not reasonably susceptible.*

Courts have ruled on this question of reasonable interpretations as applied to patent application claims. For example, *In Re Howard,* 53 F. 2d 523, 525 (1931) the Court of Customs and Patent Appeals said:

> "We think the *fair* construction of the claims here under consideration, *especially when read in the light of appellant's specification* is that only the condensates from his first cracking operation enter his independent cracking zone." (Emphasis supplied).

The same Court has ruled:

> "Of course anything may be denominated fabric which has been manufactured. . . . a locomotive, a pair of shoes, or a mouse trap, under the broad meaning, as contained in the [Patent Office] decision * * * We think that the *reasonable* meaning to be attached to the use of the term 'non-fabric', *especially in its context,* being *coupled* with the expression 'thin foraminous' and 'particulate film surfacing,' is capable of no other meaning than that contended for by appellant. * * * It will not do to segregate the single expression 'non-fabric' from its context, as has been done by the tribunals of the patent office." *In re Frederick,* 175 F. 2d 451, 466 (1949).

The U. S. District Court for the District of Columbia in *Turchan* v. *Marzall, Com'r of Pats.,* 105 F. Supp. 266, 268-270 (1952) construed a patent application claim which called for "... a template disposed in fixed position aligned with the axis of the work. . .". The defendant contended that according to the dictionary meaning of "align", the claim required the template and the work to be placed "in a line", or in end-to-end relation. The defendant argued that the claim was unpatentable as unsupported by the specification and drawings which illustrated the template and work to be parallel. The Court said:

> ". . . In resolving the ambiguity of meaning existing in the language of a claim, *it is accepted practice to look to the specification and drawings for enlighten-*

> *ment.* When that is done in this case, one learns that the word 'aligned' of the claim means parallel. Although the Patent Office has relied on the dictionary meaning of the word, it does not appear to the Court that the definition of the word 'align' found therein is in any sense controlling.
>
> * * *
>
> ". . . The *language of the specification* and the *testimony of the plaintiff's witnesses compels* the Court to conclude that the limitation of the claim here under consideration sufficiently discloses that a parallel disposition of the axis of the template and that of the workpiece is required by the plaintiff's patent [application]." (Emphasis supplied).

Especially noteworthy and confirmatory is the decision of Judge Morris on motion for rehearing in *United States Rubber Co.* v. *Marzall, Com'r. Pats.,* 91 F. Supp. 1, 5 (D.C. D.C. 1950).

The foregoing cases belie the appellee's intended import of *In re Carr,* supra, and the related C.C.P.A. cited (His Brief, page 16), as applied to the facts presented by the present appeal.

Appellee's semantic endeavors regarding the wording of Claim 16 must fail here in the face of the meaning in the art, the clear intention of the application, and the legal principles announced by the Courts.

The Keil patent, being inoperative, does not meet the substance of Claim 16 in issue. And in disclosing *wire gauze* the Keil patent does not meet the terms of Claim 16.

IV. THE ASSERTED COMBINATION OF REFERENCE PATENTS TO NEGATIVE PATENTABILITY OF THE CLAIMS IN ISSUE IS IMPROPER UNDER THE APPLICABLE LAW AND THE FACTUAL RECORD

The appellee states (Brief, p. 18):

> "Tornblom's basic contribution, reduced to its essentials as in claims 18 and 19, may be said to be a

> modification of the 'Davy' type fixtures of the prior art, by the employment of a new and improved flame arresting material."

Now that Tornblom's invention has been disclosed and has been successful, one may find it easy to spot the defects of the prior art, to put together and synthesize the Tornblom structure, and to say "It was simple". But that is not the test of patentable invention.

> "The fact that the combination later appears to be a simple one does not necessarily negative the presence of a high degree of inventive genius. * * * We recognized these principles in Electrons, Inc. v. Coe, 1938, 69 App. D.C. 181, 99 F. 2d 414." *Levin* v. *Coe,* Com'r Pats. 76 App. D.C. 347, 132 F. 2d 589, 596 (1942).

Appellee's assertion that this case is merely one of substitution is wrong in its premise. It assumes as a fact that the Davy lamp had a flame arresting material. In that assumption it is wrong. The flame of a Davy lamp, even under the influence of a "sudden draught", will blow through the screening used (Ganot's Physics, App. 164).

Appellee's further contention that the asserted combination would be obvious to one skilled in the art is without support on this record. The evidence denies such contention (App. 107).

It takes more than showing the parts are individually old to preclude invention. *Levin* v. *Coe, Com'r Pats.,* 76 App. D.C. 347, 132 F. 2d 589, 596 (1942).

A. References Disclosing Inoperative Explosionproof Devices Taught The Art Nothing—Even Mislead It

The appellee seeks (Brief, p. 13) to establish that inoperativeness of references is immaterial to the ultimate question of whether the claims define patentable invention. Appellee apparently concedes that the Williams, Keil and Gover devices to be inoperative as electrical explosionproof fixtures, and that inoperativeness of a reference device can and may "outlaw" it as an anticipation, but states that such inoperativeness *"does not necessarily"* outlaw the reference (Appellee's Brief, pages 13, 19). The cases cited by appellee do not support his contention on this record.

Appellee quotes (Brief, p. 13) from and relies (Brief, p. 20) upon *Gilbert et al.* v. *Marzall,* 87 App. D.C. 1, 182 F. 2d 389 (1950). That case reveals itself to rule that where *one portion* of a composite prior device is inoperative, *another portion* of the prior device which is operative may anticipate, where the claims in issue relate to the latter portion. Appellee failed to note that this Court said in the *Gilbert et al.* decision.

> ". . . We find nothing in the record to convince us of the alleged inoperativeness of *those portions* of the prior inventions which the Patent Office and the District Court found to have anticipated the claims here in issue." (182 F. at p. 395; Emphasis Supplied)

Moreover, this Court in the Gilbert et al. decision relied upon the authority of *Pickering* v. *McCollough,* 104 U.S. 310, 319 (1881) where it was said:

> "But on examination it sufficiently appears, we think that the objections [to the reference devices not being capable of practical working] can be sustained only as to *minor* matters of detail in construction, *not affecting the substance of the invention claimed,* and could be removed by mere mechanical skill, without the exercise of the faculty of invention." (Emphasis Supplied)

Appellee cannot twist the prior disclosures here to come within the purview of these cases.

Appellee also quotes (Brief, p. 13) from and relies (Brief, p. 20) upon *Otis* v. *Marzall,* 88 App. D.C. 332, 189 F. 2d 653, 656 (1951), where it was said:

> "However, the *testimony is consistent with the conclusion that the* [*prior Knowlton*] *device in fact was*

> *operative,* though not on an efficient basis, and that it was discarded on the basis of its clumsiness as much as anything else. * * * But the fact is inescapable that even though the Knowlton invention may have been inefficient or actually inoperative, it taught lessons which have now come to fruition." (Emphasis Supplied)

The *Otis* case was thus decided on the conclusion that the prior device was, indeed, operative. And the last sentence quoted above falls in line with *Pickering* v. *McCollough, supra,* where the defects were "minor matters of detail".

In the case at bar, the very element (wire gauze or screen) of the prior devices of Williams, Keil and Gover—which was *supposed* to make them explosionproof—is the portion which makes them *inoperative* as explosionproof electric fixtures (Appellant's Brief, pages 24-27). And that is an element which lacks the substance of the invention claimed by Tornblom.

The Williams, Keil and Gover references have been necessarily "outlawed" as anticipating references, under the authority of *In re Coykendall,* 58 App. D.C. 280, 29 F. 2d 868 (1928) (Appellant's Brief, p. 27, 28). The *Gilbert et al.* v. *Marzall* and *Otis* v. *Marzall* decisions, *supra,* relied upon by the appellee, *by stating the exceptions* to the rule, show clearly the error by the Court below in its reliance on these reference patents.

Recognition of the source of inoperativeness and inefficiency and the reasons for it, after the references stood for many years, is the cornerstone of many inventions of patentable merit. Again we refer to *Eibel Process Co.* v. *Paper Co., supra,* where the Supreme Court ruled:

> "... we must not lose sight of the fact that *one essential part of Eibel's discovery* was that the trouble causing the defective paper product under high machine speed was in the disturbance and ripple some ten feet from the discharge. * * * The invention was *not* the mere use of a high or substantial pitch to remedy

> a known source of trouble. *It was the discovery of the source not before known and the application of the remedy* for which Eibel was entitled to be rewarded in his patent." (Emphasis supplied) (261 U.S. at pp. 67, 68)

The same rationale bearing on the ultimate question of patentable invention has been applied in numerous other cases.

The Williams, Keil and Gover patent disclosures pointing as they do to the impossibility of a *safe* electrical vented type explosionproof fixture (Appellant's Brief, p. 5), support, rather than deny, the presence of patentable invention.

B. The Baker Patent Did Not Teach That The Williams, Keil and Gover Devices Were Inoperative, and Did Not Suggest Either How to Make Them Operative or the Advantages to be Gained

Appellee apparently concedes (His Brief, p. 13) that the record establishes that the Baker reference patent did not suggest to engineers employed by the owning company that it could be adapted into an explosionproof lighting fixture. This was the fact even though they had acetylene generating plants wherein an explosion hazard existed, and took safety precautions to prevent explosions (App. 128, 129).

Appellee retreats to an argument (Brief, p. 13) that "the *actual* suggestive effect of the Baker patent on its owners has no direct bearing on what the patent *should* have taught experts in the art". If the Baker patent did not suggest further uses of its teachings to the Union Carbide engineers, who else would be more likely to derive a suggestion from it?

Appellee would like to remove the thorn of this evidence by contending (Brief, p. 21) that the record does not show either (1) that the Union Carbide engineers had any knowledge of the Williams, Keil and Gover patents, or (2) that such engineers were actively engaged in the design of explosionproof electric lamps.

To contend the engineers did not know of the Davy lamp is nonsense. The Trial Court knew of it and took judicial notice it had been used since 1880 (App. 140). Whether the Union Carbide engineers had actual knowledge of the particular reference patents or not, is not material. So much of the Williams, Keil and Gover patents as is correct and relevant is the subject of elementary physics courses. (Cf. Ganot's Physics, App. 163, 4).

On the second point, it has been established in the record (App. 129) that Union Carbide had acetylene generating plants presenting explosion hazards and took safety precautions in such plants to guard against explosions. If Baker couldn't suggest to its engineers concerned with safety in welding apparatus and acetylene plants an improvement in the field of explosionproof lighting fixtures, then the Baker patent in dealing with welding equipment was in a nonanalogous art and of no material benefit to someone like Tornblom working in the field of explosionproof lighting fixtures.

Even the hindsight argument of appellee fails (Appellee's Brief, pages 18-21). That hindsight is an improper test of patentable invention is an accepted rule of patent law (*Lucke* v. *Coe,* Com'r. Pats., 63 App. D.C. 61; 69 F. 2d 379, 383 [1934]). The Baker patent which, itself, relates to an open flame welding torch, would not have suggested why the Williams, Keil and Gover disclosures were unsafe as electrical explosionproof fixtures. The Baker patent gives no hint that an electrical explosionproof fixture could be vented, let alone suggesting how.

Still further the Baker reference discloses a device which does not fit the task assigned to it by the appellee. The porous metal element does not prevent the pressure of the backfire in the outlet conduit and does not dissipate or *vent* that pressure. Such pressure is merely transferred to the inlet conduit (App. 102). The Baker housing, therefore, has to have thick and strong walls to withstand the pressures created by a backfire.

Tornblom's invention utilizes a rigid porous metal element to arrest flame. To that extent it is similar to Baker's device. But, contrary to Baker's teachings, Tornblom's invention utilizes a porous metal element to *vent* expanding gases so that they cannot create appreciable pressure inside a fixture casing. The walls of that casing can be made thinner, lighter, and of less expensive material (Appellant's Brief, p. 6). This operation and construction is not suggested or even hinted by Baker.

The whole of appellee's argument on the surface sounds plausible. But on analysis, it is an argument contrary to the proven fact, and is merely Monday quarterbacking after the game is an accomplished fact. The very ingenuity and intricacy of appellee's reasoning, *after the event,* attests to the conclusion that Tornblom's invention would not have been obvious to one skilled in the art *at the time* the invention was made.

V. CLAIMS 20 TO 23 DEFINE PATENTABLE INVENTION OVER THE PRIOR PATENTS TO TORNBLOM OR BISSEL TAKEN WITH BAKER, WILLIAMS OR KEIL

Appellant agrees with the opening sentence on page 22 of the Appellee's Brief: Claims 20-23 do not raise issues materially different from those created by claims 16, 18 and 19.

Claims 20-23, as do the other claims in issue, include the structure embodying Tornblom's present invention—a structure that provides a *safe,* explosionproof vented lighting fixture which is lighter, less expensive and less bulky. These claims should be patentable for the same forceful reasons previously expressed.

CONCLUSION

The Appellee's Brief brings forth nothing to alter our previous showing that the judgment of the District Court should be reversed.

Respectfully submitted,

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